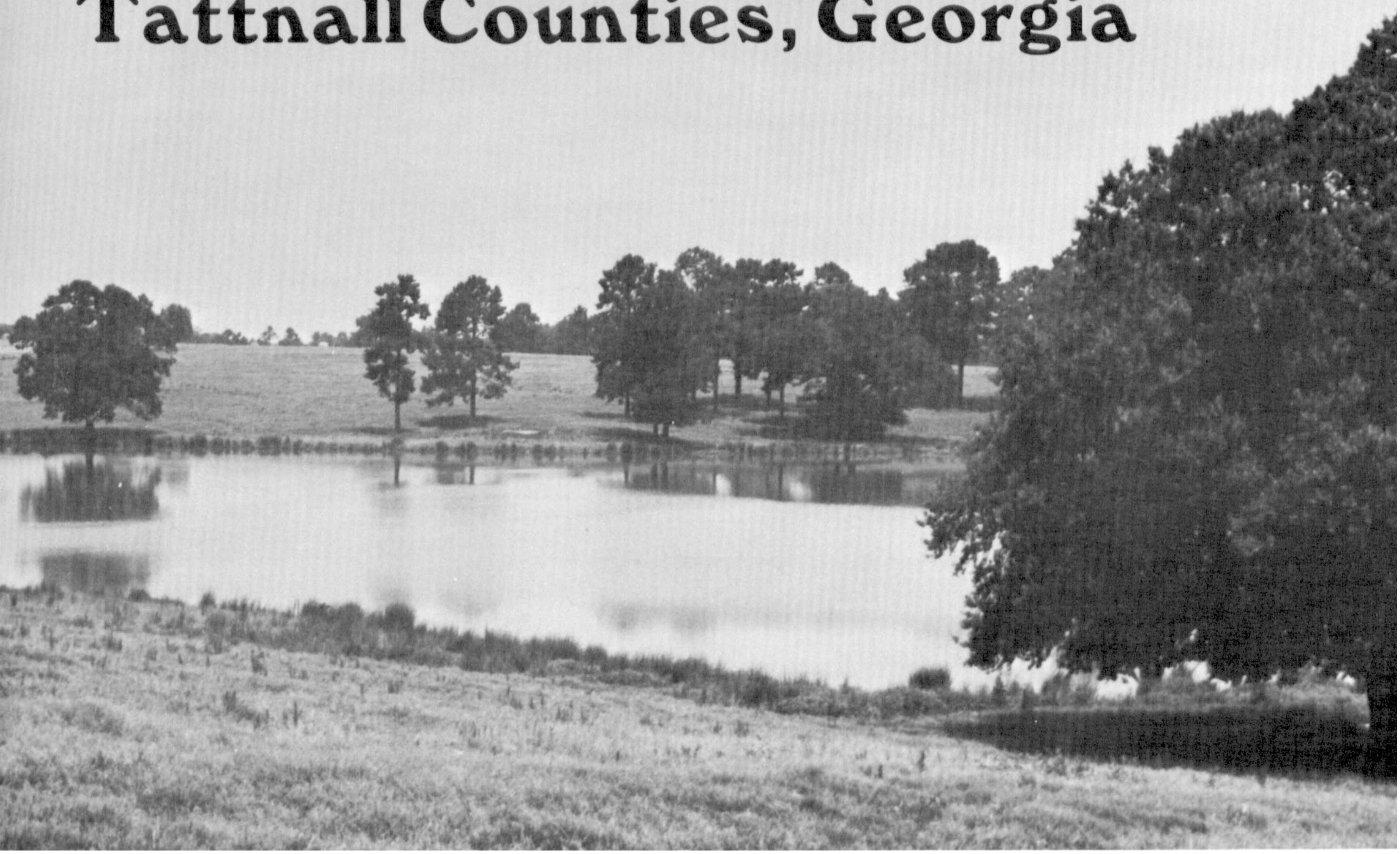
SOIL SURVEY OF

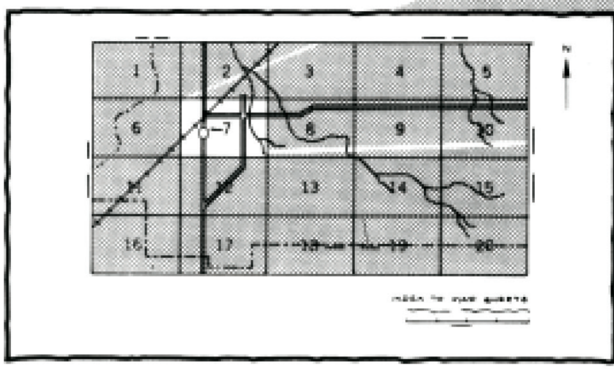
Candler, Evans, and Tattnall Counties, Georgia

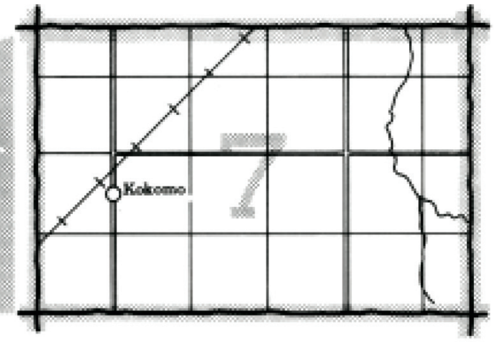


U. S. Department of Agriculture, Soil Conservation Service,
in cooperation with
University of Georgia, College of Agriculture,
Agricultural Experiment Stations

HOW TO USE

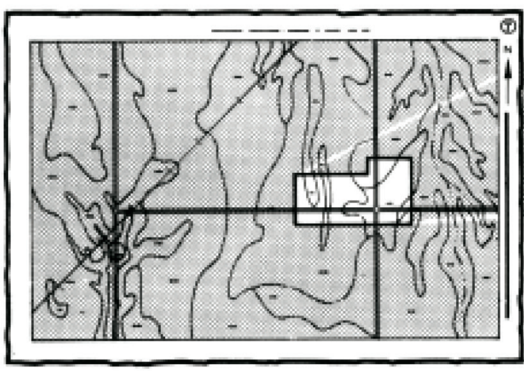
1. Locate your area of interest on the "Index to Map Sheets"

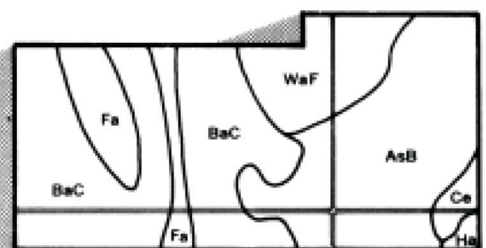




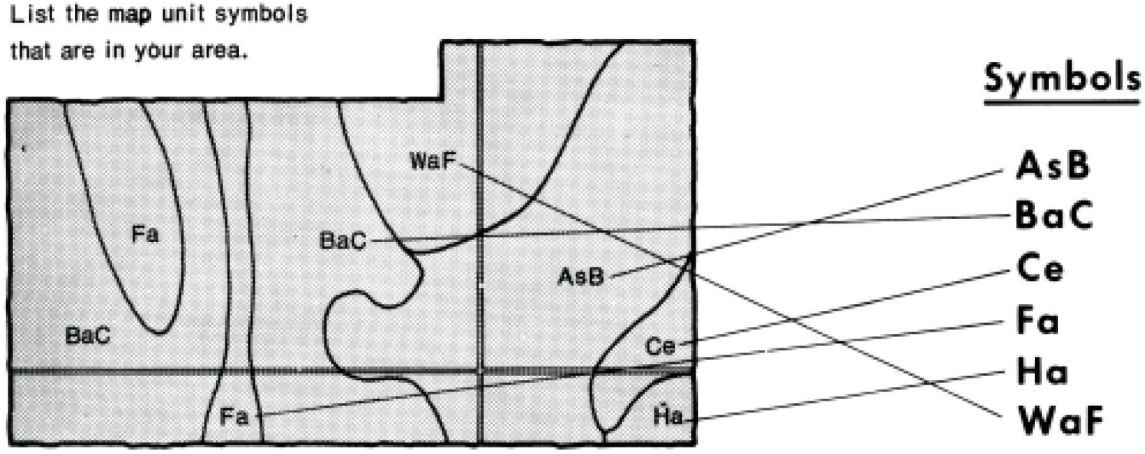
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.



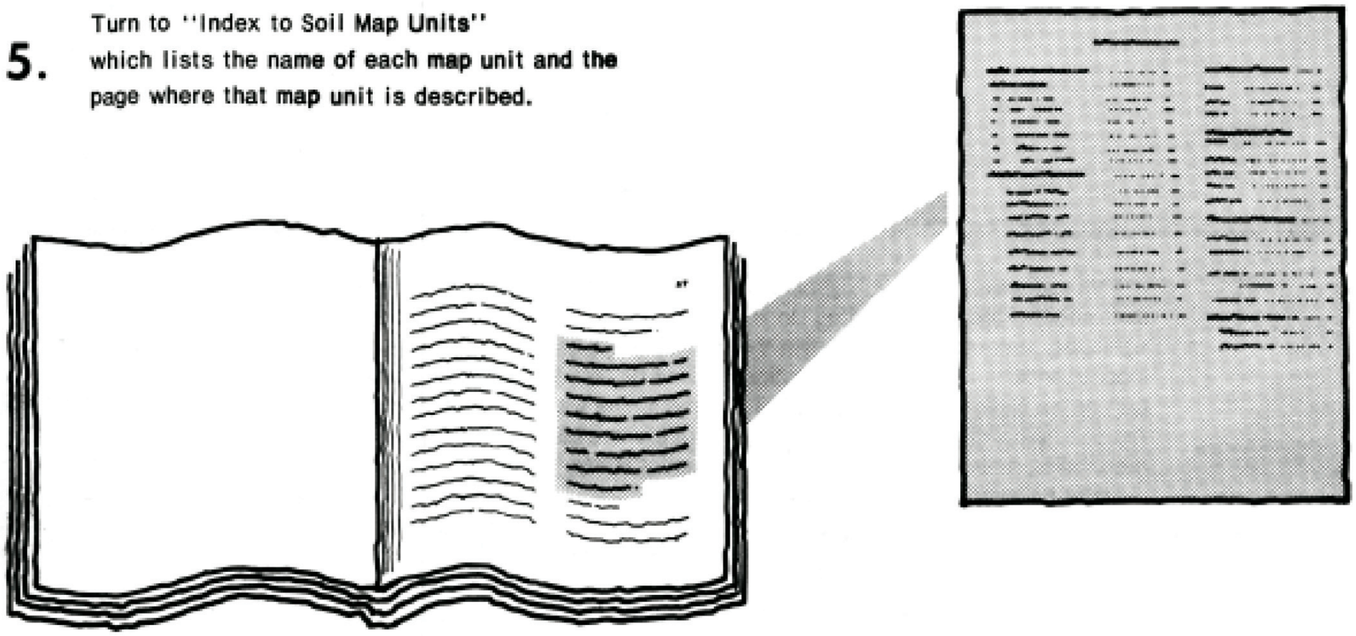


4. List the map unit symbols that are in your area.

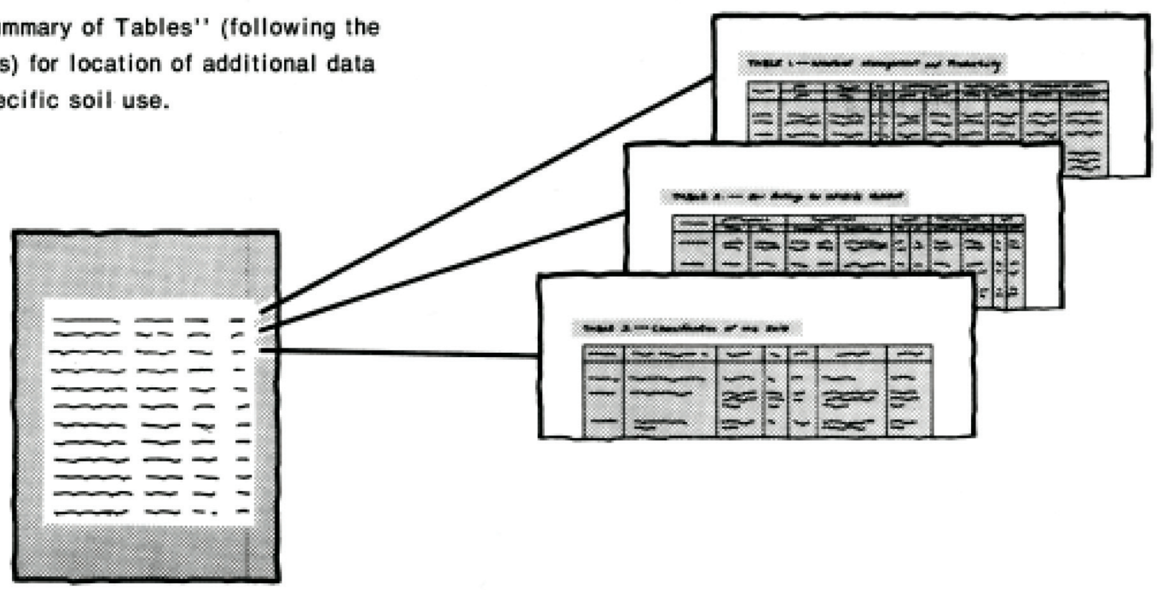


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1965 to 1975. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1976. This survey was made cooperatively by the Soil Conservation Service and the University of Georgia, College of Agriculture, Agricultural Experiment Stations. It is part of the technical assistance furnished to the Ogeechee River Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps can cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

Cover: Coastal bermudagrass and pond in a typical area of the Tifton-Fuquay map unit.

Contents

Issued February 1980

Index to soil map units

Summary of Tables

Foreword

The Soil Survey of Candler, Evans, and Tattnall Counties, Georgia, contains much information useful in any land-planning program. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

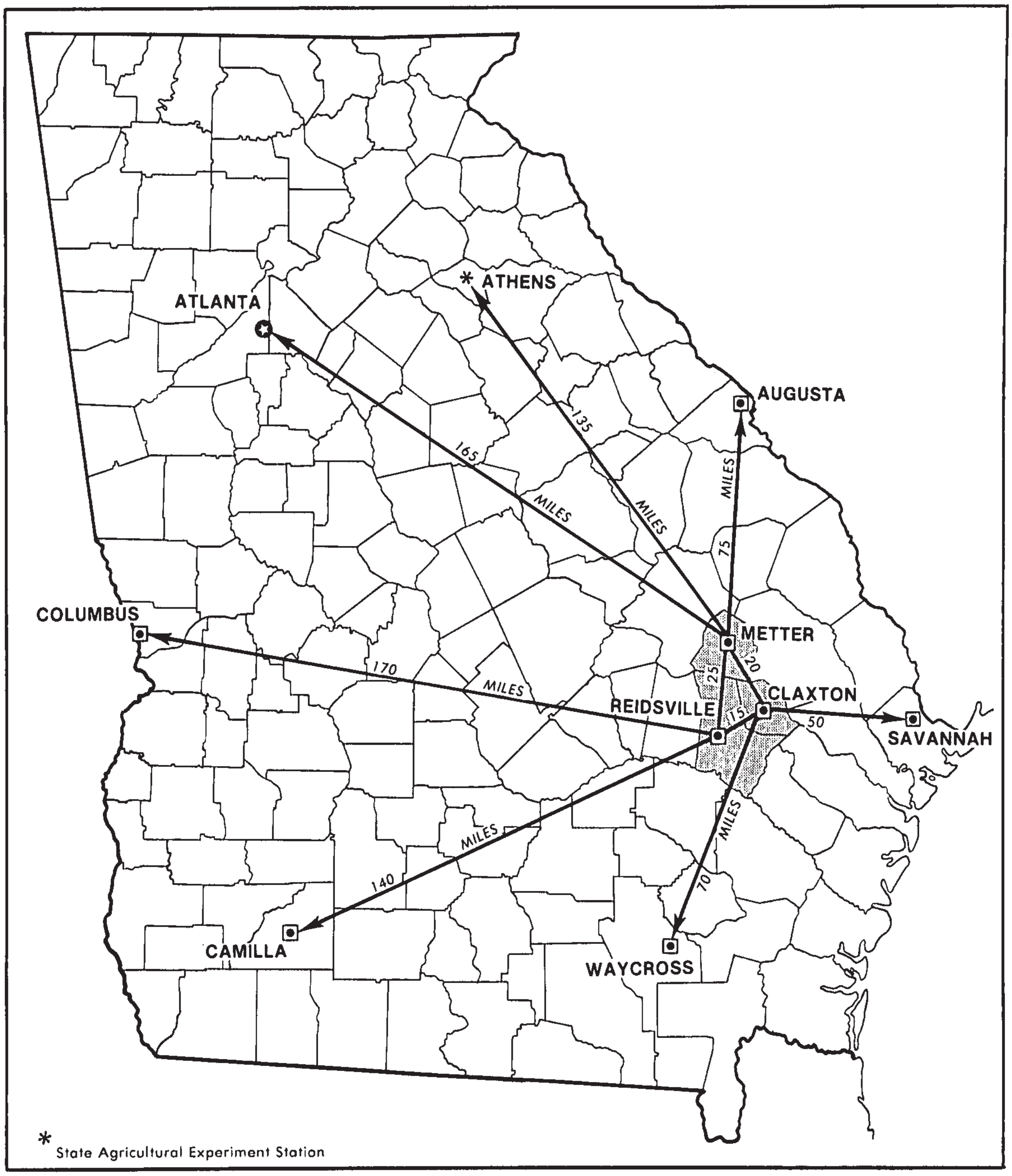
Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. They may be too unstable to be used as a foundation for buildings or roads. Very clayey or wet soils are poorly suited to septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.

Dwight M. Treadway

Dwight M. Treadway
State Conservationist
Soil Conservation Service



Location of Candler, Evans, and Tattnall Counties in Georgia.

SOIL SURVEY OF CANDLER, EVANS, AND TATTNALL COUNTIES, GEORGIA

By Herschel L. Paulk, Soil Conservation Service

Fieldwork by Herschel L. Paulk, Jack R. Brown, Daniel D. Monts, and Tommy Lee Coleman, Soil Conservation Service

U. S. Department of Agriculture, Soil Conservation Service, in cooperation with University of Georgia, College of Agriculture, Agricultural Experiment Stations

CANDLER, EVANS, AND TATTNALL COUNTIES are in the southeastern part of Georgia. (See map on facing page.) They have a total land area of 927.1 square miles, or 593,351 acres. Candler County has an area of 160,506 acres, or 250.8 square miles, and has a population of 6,412. Metter is the county seat and has a population of 2,912. Evans County has an area of 119,173 acres, or 186.2 square miles, and has a population of 7,290. Claxton is the county seat and has a population of 2,669. Tattnall County has an area of 313,672 acres, or 490.1 square miles, and has a population of 16,557. Reidsville is the county seat and has a population of 1,806.

The survey area is drained mainly by the Canoochee, Ohoopee, and Altamaha Rivers and their tributaries. The Ohoopee River flows south and forms the western boundary of Candler County and the northwestern boundary of Tattnall County. It then flows through Tattnall County into the Altamaha River. The Altamaha River forms the southern boundary of Tattnall County. The Canoochee River flows southeast through the central part of Candler and Evans Counties and forms the southeastern boundary of Evans County.

Elevation ranges from 46 feet near Stafford's Lake along the Altamaha River at the southeastern tip of Tattnall County to 307 feet in Candler County near the Candler-Emanuel County line on Georgia Highway 23.

Candler County and most of Evans and Tattnall Counties are in the Southern Coastal Plain Major Land Resource Area. The soils in this part of the survey area are mainly on uplands, predominantly nearly level and gently sloping, and are mostly well drained. Most of the soils have a sandy surface layer and a loamy subsoil. The southern part of Evans County and the east-central and southern parts of Tattnall County are in the Atlantic Coastal Flatwoods Major Land Resource Area. The soils in this part of the survey area are nearly level and are on low uplands. Most of these soils are seasonally wet or are wet during most of the year. They have a sandy surface layer and a loamy subsoil. A large acreage of soils is in low, flat areas along the Altamaha River. These soils are subject to annual flooding. They have a loamy surface layer and mainly have a clayey subsoil.

General nature of the survey area

This section gives general information concerning the counties. It discusses climate, history and development, natural resources, and farming.

Climate

Climatic data in this section were specially prepared for the Soil Conservation Service by the National Climatic Center, Asheville, North Carolina.

Candler, Evans, and Tattnall Counties have long hot summers, because moist tropical air from the Gulf of Mexico generally covers the area. Winters are cool and fairly short. Cold waves are rare and moderate in 1 or 2 days. Precipitation is fairly heavy throughout the year, and prolonged drought is rare. Summer precipitation occurs mainly as afternoon thundershowers and is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area, as recorded at Glennville, Georgia, for the period 1951 to 1974. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 52 degrees F, and the average daily minimum temperature is 41 degrees. The lowest temperature on record, which occurred at Glennville on December 13, 1962, is 9 degrees. In summer the average temperature is 80 degrees, and the average daily maximum temperature is 91 degrees. The highest recorded temperature, which occurred on June 27, 1952, is 106 degrees.

Growing degree days, shown in table 1, are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 29 inches, or 60 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 25 inches. The heaviest 1-day rainfall during the period of record was 8.52 inches at Glennville on May 19, 1969. Thunderstorms occur on about 65 days each year and on about 39 days in summer.

Snowfall is rare; in 85 percent of the winters, there is no measureable snowfall. In 91 percent, the snowfall is less than 1 inch.

The average relative humidity in midafternoon in spring is less than 50 percent; during the rest of the year it is about 55 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The percentage of possible sunshine is 65 in summer and 55 in winter. The prevailing wind is from the southwest. Average windspeed is highest, 10 miles per hour, in March.

Severe local storms, including tornadoes, occasionally occur in or near the survey area. These storms are of brief duration, and damage varies. Every few years in summer or fall, a tropical depression or the remnant of a hurricane which has moved inland causes extremely heavy rainfall for a period of 1 to 3 days.

History and development

This survey area was originally occupied by the Creek Indians. In the Treaty of Augusta, 1733, the Creek Indians ceded to Georgia a wide area between the Ogeechee and Altamaha Rivers. The area included what is now Candler, Evans, and Tattnall Counties. It was frontier country, bordering the English settlements to the east which extended only about 30 miles inland. For several decades after the treaty was signed, this forest land was little more than a hunting and trading ground.

Soon after the Revolution ended, settlers came to claim land made available by the Government to patriots who survived the war and to families of those who had not.

Most of the early settlers came from the Carolinas and Virginia and from older settlements in Georgia. A few came from more northerly States along the eastern seaboard. They first settled along the uplands joining the Altamaha, Canoochee, and Ohoopee Rivers. Roads gradually developed into trade routes leading toward Savannah, because most items were hauled by wagon. Small streams were forded, and the rivers were crossed by flatboat ferries or by toll bridges. This method of transportation continued until the railroads were built in about 1845, linking this area with Savannah.

This survey area was first a part of Washington, Effingham, and Liberty Counties, then it was divided into Montgomery, Bulloch, and Liberty Counties.

Tattnall County was created by an act of the General Assembly of Georgia on December 5, 1801, from land that was formerly a part of Montgomery County. The county was named in honor of General Josiah Tattnall, a distinguished Revolutionary patriot who became a Governor of Georgia. Reidsville was named the county seat in 1832.

Candler County was created by an act of the General Assembly of Georgia on July 14, 1914, from land that was a part of Bulloch, Tattnall, and Emanuel Counties. The county was named in honor of Allen Daniel Candler, a former Governor of Georgia. Metter was named the county seat.

Evans County was created by an act of the General Assembly of Georgia on August 11, 1914, from land that was a part of Bulloch and Tattnall Counties. The county was named in honor of Confederate Army Brigadier-General Clement Anselm Evans, who was also a statesman, Methodist minister, and writer. Claxton was named the county seat.

Settlement of Tattnall County advanced slowly until 1870. Upon the advancement of railroads in this area, population rapidly expanded. The population of Tattnall County in 1870 was 4,860, and it increased to 10,253 by 1890. By 1900, the population was 20,419. The population of Tattnall and Evans Counties has not changed greatly since they assumed their present boundaries in 1914. The population of Candler County remained about the same until the early 1940's. Since then it has decreased.

Candler, Evans, and Tattnall Counties are mainly agricultural, but lumber, pulpwood, poultry processing, garments, baking, and feed manufacturing are a few of the other important industries.

These counties have good ground transportation routes to local and out-of-area markets. One railroad passes through Claxton and Collins, and a spur goes from Metter to Statesboro.

Natural resources

Soil is the most important natural resource in Candler, Evans, and Tattnall Counties. Well managed soils produce abundant crops for market. Livestock that graze these lands and wood crops that are grown and harvested are important products derived from the soil.

Deep wells drilled into the Ocala Limestone aquifer produce abundant water for domestic use and for irrigation. These wells range from 350 to 600 feet deep. Also, more than 1,000 farm ponds are used for livestock water and for irrigation and recreation. The Canoochee, Ohoo-

pee, and Altamaha Rivers are permanent streams that are also a source of water.

Farming

From the time of the first settlements in Candler, Evans, and Tattnall Counties in the 18th century, farming and stockraising have existed. The pioneers made small clearings in the well drained parts of the pine woods, and they grew corn, wheat, and vegetables for home use. Rice also was widely grown in the flatlands that could be flooded with water when needed.

At first, cattle, sheep, and hogs were the chief sources of income, but cultivated crops gradually took the lead as the population increased, markets became accessible, and additional land was cleared. Cultivated fields were fenced, but all other land was considered open range for livestock. Cotton became the main money crop and held this position until the late 1920's, when a prosperous agriculture based on tobacco began to develop (fig. 1). Peanuts also became a main money crop in the early 1940's.

Improved varieties, soil selection, and improved cultural methods helped the early agricultural development. It was found that cotton grew better on such rocky soils as Tifton loamy sand. After 1899, larger amounts of commercial fertilizer were used to increase crop yields.

During the economic depression in the early 1930's, misuse of the land increased soil erosion on most sloping fields. Many fields were abandoned because crop yields were low. Changes in land ownership were common, and soil productivity was not maintained in most fields.

The enactment of the Soil Conservation District legislation in 1937 by the State of Georgia was supported by the leading farmers in Candler, Evans, and Tattnall Counties. The Ogeechee River Soil and Water Conservation District was organized in 1940. In 1942, farmers in Candler and Evans Counties joined the District through a referendum and later, in 1947, the farmers in Tattnall County joined the District. Farmers in these counties recognized the need for soil conservation to control soil erosion and to improve or maintain productivity. They instituted land-use changes and installed such conservation practices as terraces, grassed waterways, improved pastures, and ponds. Today these counties contribute significantly to farming and to wood production.

According to the U.S. Census of Agriculture, in 1969 Candler County had 60.9 percent farmland; Evans County had 55.2 percent; and Tattnall County had 60.3 percent. These counties are important farming areas in the State. Large acreages of high yielding corn, peanuts, tobacco, soybeans, and truck crops are grown (fig. 2). Large acreages of improved bermudagrass and bahiagrass pasture are also grown.

With the increased use of farm machinery and improved tillage methods, the number of farms has decreased, but the acreage in farms has increased. According to the U.S. Census of Agriculture, in 1964 Candler County had 579 farms, and the average size was 184.6 acres. In 1969, the number of farms had decreased to 441, and the average size increased to 221.4 acres. In 1964, Evans County had 323 farms, and the average size was 179.7 acres. In 1969, the number of farms had decreased to 317, and the average size increased to 208.3 acres. In 1964, Tattnall County had 1,059 farms, and the average size was 183.7 acres. In 1969, the number of farms had decreased to 942, and the average size increased to 200.7 acres.

Sale of livestock and poultry and their products provide about 58 percent of the total farm income in the three counties. According to the U.S. Census of Agriculture, the farm income from sale of livestock and poultry and their products nearly doubled from 1964 to 1969. There are four livestock markets in the three counties.

The sale of wood products also provides an important part of the farm income (fig. 3).

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material, which has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in counties nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil; others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the sections "General soil maps for broad

land use planning" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily available to different groups of users, among them farmers, managers of rangeland and woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

General soil maps for broad land use planning

The general soil maps at the back of this publication show, in color, map units that have a distinct pattern of soils and of relief and drainage. Each map unit is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil maps provide a broad perspective of the soils and landscapes in the survey area. They provide a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the maps. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of their small scale, the maps do not show the kind of soil at a specific site. Thus, they are not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The kinds of soil in any one map unit differ from place to place in slope, depth, drainage, or other characteristics that affect their management.

The soils in the survey area vary widely in their potential for major land uses. The estimates of soil potential are based on the assumption that practices in common use in the survey area are being used to overcome soil limitations.

The potential of each map unit for cultivated farm crops, woodland, urban uses, and wildlife habitat is given in this section. Cultivated farm crops are those grown extensively by farmers in the survey area. Woodland refers to land that is producing either trees native to the area or introduced species. Urban uses include residential, commercial, and industrial developments. Wildlife habitat refers to the kind of environment in which an animal generally lives; the soils are evaluated for their potential to provide food, cover, and water which are essential for wildlife.

Candler County

1. Tifton-Fuquay-Dothan

Well drained soils that have a loamy subsoil; on broad uplands; 0 to 8 percent slopes

This map unit is in large areas scattered throughout Candler County. It is on broad uplands. It has a well developed drainage system consisting of small drainageways that lead to branches that flow into creeks. The branches and creeks generally flow to the southeast or south. On nearly all of the soils in this unit, slopes range from 0 to 8 percent but are mainly 0 to 5 percent.

This map unit makes up about 42 percent of the county. About 33 percent of the unit is Tifton soils, 20 percent is Fuquay soils, 12 percent is Dothan soils, and the rest is soils of minor extent.

Tifton soils typically have a surface layer of very dark grayish brown loamy sand about 10 inches thick that has many small nodules of ironstone. The subsoil is more than 53 inches thick. The upper part of the subsoil is brownish yellow sandy loam that has nodules of ironstone; the middle part is yellowish brown sandy clay loam with strong brown, red, and dark red mottles that are mostly plinthite; and the lower part is mottled yellowish brown, strong brown, red, and light gray sandy clay loam and is about 20 percent plinthite.

Fuquay soils typically have a surface layer of dark grayish brown loamy sand about 11 inches thick. The subsurface layer is loamy sand about 17 inches thick; it is light yellowish brown in the upper part and brownish yellow in the lower part. The subsoil is more than 40 inches thick. The upper part of the subsoil is brownish yellow sandy loam, and the middle part is brownish yellow sandy clay loam. The lower part is brownish yellow sandy clay loam with strong brown, yellowish red, red, and gray mottles and is about 8 to 15 percent plinthite.

Dothan soils typically have a surface layer of grayish brown loamy sand about 7 inches thick. The subsurface layer is light yellowish brown loamy sand about 3 inches thick. The subsoil is more than 60 inches thick. The upper part of the subsoil is yellowish brown sandy loam, and the middle part is yellowish brown sandy clay loam. The lower part is yellowish brown sandy clay loam with

yellowish red, dark reddish brown, red, and light gray mottles and is more than 5 percent plinthite.

The soils of minor extent in the higher parts of this map unit are the well drained Cowarts and Carnegie soils. The soils of minor extent along small branches and creeks are poorly drained Pelham and Osier soils, moderately well drained Stilson soils, and somewhat poorly drained Leefield and Albany soils.

About 80 percent of the acreage of this map unit is used for crops. The main crops are corn, tobacco, peanuts, soybeans, small grains, hay, and pasture. Erosion is a moderate hazard on the more sloping soils. Wetness is the main limitation to the use of the soils along branches and creeks for farming and for most other purposes.

If this unit is adequately protected from erosion, in most areas it has high potential for cultivated crops and for homesites and other urban uses. The potential for pines and hardwoods is high to medium, and the potential for development of openland wildlife habitat is high.

2. Fuquay-Cowarts-Bonifay

Well drained soils that have a loamy subsoil; on narrow ridgetops and short, irregular, convex hillsides; mostly 2 to 8 percent slopes

This map unit is in areas scattered throughout Candler County. It is on narrow, very gently sloping ridgetops bordered by short, irregular, gentle slopes.

This map unit makes up about 26 percent of the county. About 22 percent of the unit is Fuquay soils, 22 percent is Cowarts soils, and 15 percent is Bonifay soils. The rest is soils of minor extent.

Fuquay soils are well drained and are mostly on ridgetops. They typically have a surface layer of dark grayish brown loamy sand about 11 inches thick. The subsurface layer is loamy sand and is about 17 inches thick. It is light yellowish brown in the upper part and brownish yellow in the lower part. The subsoil is more than 40 inches thick. The upper part of the subsoil is brownish yellow sandy loam, the middle part is brownish yellow sandy clay loam, and the lower part is brownish yellow sandy clay loam that is about 8 to 15 percent plinthite. Mottles are strong brown, yellowish red, red, and gray.

The well drained Cowarts soils have short, irregular slopes on uplands. Cowarts soils typically have a surface layer of dark grayish brown loamy sand about 7 inches thick. The subsurface layer is light yellowish brown loamy sand about 4 inches thick. The upper part of the subsoil is yellowish brown sandy clay loam; the middle part is brownish yellow or mottled, friable and firm sandy clay loam that is 5 percent or more plinthite; and the lower part is mottled red, yellowish red, light gray, red, and brownish yellow, firm sandy clay.

The well drained Bonifay soils are on ridgetops and gentle slopes. Bonifay soils typically have a surface layer of gray fine sand about 5 inches thick. The subsurface layer is fine sand about 52 inches thick. The upper part of the subsurface layer is light yellowish brown, the middle part is very pale brown and has yellowish brown mottles, and the lower part is very pale brown and brownish yellow. The subsoil is sandy loam and sandy clay loam and is more than 23 inches thick. It is yellowish brown in the upper part, and it is brownish yellow and has light gray, yellowish red, and red mottles in the lower part. The lower part is about 8 percent plinthite.

The soils of minor extent on ridgetops and gentle side slopes are the well drained Tifton, Carnegie, and Dothan soils. The soils of minor extent along small branches and creeks are the poorly drained Pelham and Osier soils and the somewhat poorly drained Leefield soils.

About 50 percent of the acreage of this map unit is used for crops. The main crops are corn, tobacco, peanuts, soybeans, small grains, hay, and pasture. Erosion is a moderate to severe hazard on the more sloping soils. Wetness is the main limitation to the use of the soils along branches and creeks.

Most of this unit has medium to low potential for cultivated crops and for pines and hardwoods. It has medium to high potential for most urban uses. It has high potential for development of openland and woodland wildlife habitat.

3. Kershaw-Bonifay

Excessively drained and well drained soils that have sandy underlying layers or a loamy subsoil; mainly on broad dunelike uplands; 2 to 8 percent slopes

Areas of this map unit in Candler County are mainly adjacent to flood plains on the east side of the Ohoopee and Canoochee Rivers and Fifteen Mile Creek. These areas consist of broad sandy uplands that are dissected by a few narrow drainageways.

This map unit makes up about 12 percent of Candler County. About 58 percent of the unit is Kershaw soils, and 27 percent is Bonifay soils. The rest is soils of minor extent.

Kershaw soils are excessively drained, and in most places they are at a slightly higher elevation than the well drained Bonifay soils. Kershaw soils typically have a surface layer of dark gray sand about 3 inches thick. Below this, to a depth of 83 inches, is yellow or brownish yellow sand.

The well drained Bonifay soils typically have a surface layer of gray fine sand about 5 inches thick. The subsurface layer is fine sand about 52 inches thick. The upper part of the subsurface layer is light yellowish brown, the middle part is very pale brown with yellowish brown and brownish yellow mottles, and the lower part is brownish yellow. The subsoil is sandy loam and sandy clay loam and is more than 23 inches thick. It is yellowish brown in the upper part, and it is brownish yellow and has light gray, yellowish red, and red mottles in the lower part. The lower part is about 8 percent plinthite.

The soils of minor extent are the excessively drained Kureb soils, the well drained Fuquay soils, the poorly drained Osier soils, and the very poorly drained Rutlege soils.

This unit is used mainly for pine trees. Some areas are cleared and are used for pasture. Droughtiness is the main limitation to the use of these soils for farming.

This unit has low potential for cultivated crops and pasture and low to medium potential for hardwoods and pines. It has high potential for many urban uses. It has low to medium potential for development of openland and woodland wildlife habitat.

4. Pelham-Leefield

Poorly drained and somewhat poorly drained soils that have a loamy subsoil; mainly on upland flats; 0 to 2 percent slopes

This map unit is mostly in the central and southern parts of Candler County. The areas consist of nearly level wet flats that have no major drainageways.

This map unit makes up about 4 percent of the county. About 64 percent of the unit is Pelham soils, and 24 percent is Leefield soils. The rest is soils of minor extent.

Pelham soils are at a slightly lower elevation than the Leefield soils. The poorly drained Pelham soils typically have a surface layer of very dark gray loamy sand about 7 inches thick. The subsurface layer is loamy sand and is about 25 inches thick. It is light brownish gray with gray mottles in the upper part and gray with grayish brown and light brownish gray mottles in the lower part. The subsoil is more than 40 inches thick. It is gray sandy clay loam with coarse brownish yellow and yellowish brown mottles and pockets of loamy sand in places.

The somewhat poorly drained Leefield soils typically have a surface layer of very dark gray loamy sand about 12 inches thick. The subsurface layer is pale yellow loamy sand with brownish yellow mottles. The subsoil is more than 40 inches thick. The upper part of the subsoil is light yellowish brown sandy loam with brownish yellow and brownish gray mottles; the middle part is pale yellow sandy clay loam with yellowish brown, light gray, strong brown, and red mottles; and the lower part is mottled pale yellow, light gray, and brownish yellow sandy clay loam that has 8 to 15 percent plinthite in strong brown, yellowish red, and red.

The soils of minor extent are the well drained Dothan soils, the moderately well drained Stilson soils, and the somewhat poorly drained Albany soils.

This unit is used mainly for pine trees. Only a few areas are cleared and are used for cultivated crops. Wetness is the main limitation to the use of the soils for farming and most other purposes. A seasonal high water table generally is within 1.5 and 2.5 feet of the surface, usually late in winter and early in spring.

If this unit is adequately drained, it has high potential for pine trees and medium potential for such cultivated crops as corn and soybeans. Pelham soils are generally too wet for urban uses. The unit has high potential for development of wetland wildlife habitat.

5. Osier-Pelham

Poorly drained soils that have sandy underlying layers or a loamy subsoil; on flood plains and flats; 0 to 2 percent slopes

This map unit is in areas scattered throughout Candler County. It is on or near flood plains of large branches, creeks, and rivers.

This map unit makes up about 16 percent of the county. About 71 percent of the unit is Osier soils, and 16 percent is Pelham soils. The rest is soils of minor extent.

The poorly drained Osier soils are on flood plains of large branches, creeks, and the Canoochee and Ohoopee Rivers. They typically have a surface layer of dark gray loamy fine sand, fine sandy loam, loamy sand, or sand about 6 inches thick. The subsurface layer is gray loamy sand about 6 inches thick. Below this is 28 inches of gray sand that is underlain by 22 inches or more of light gray sand.

The poorly drained Pelham soils are on low, broad flats along the branches and creeks. They typically have a surface layer of very dark gray loamy sand about 7 inches thick. The subsurface layer is loamy sand about 25 inches thick. It is light brownish gray with gray mottles in the upper part, and it is gray with grayish brown and light brownish gray mottles in the lower part. The subsoil is more than 40 inches thick. It is gray sandy clay loam with coarse brownish yellow and yellowish brown mottles and pockets of loamy sand in places.

The soils of minor extent are the moderately well drained Craven soils, the somewhat poorly drained Albany and Leefield soils, and the very poorly drained Rutlege soils.

This unit is used mainly for trees. Flooding and wetness are the main limitations to the use of the soils as farmland and woodland and for homesites and other urban uses.

This unit has high to medium potential for pine and hardwood trees. Because wetness and flooding are such severe limitations and so difficult to overcome, the unit has low potential for homesites and other urban uses. It has high potential for the development of wetland wildlife habitat.

Evans County

1. Tifton-Fuquay-Pelham

Well drained and poorly drained soils that have a loamy subsoil; on broad uplands and along drainageways; 0 to 8 percent slopes

This soil map unit is in large areas scattered throughout Evans County. It is on broad uplands. It has a well developed drainage system consisting of small drainageways that lead to branches that flow into creeks. The branches and creeks flow generally to the southeast or south. On nearly all of the soils in this unit, slope ranges from 0 to 8 percent but is mainly 0 to 5 percent.

This map unit makes up about 33 percent of the county. About 40 percent of the unit is Tifton soils, 24 percent is Fuquay soils, and 18 percent is Pelham soils thick. The rest is soils of minor extent.

The well drained Tifton soils are on uplands. They typically have a surface layer of very dark grayish brown loamy sand about 10 inches thick that has many small nodules of ironstone. The subsoil is more than 53 inches thick. The upper part of the subsoil is brownish yellow sandy clay loam, and the lower part is brownish yellow sandy loam that has nodules of ironstone; the middle part is yellowish brown sandy clay loam with strong brown, red, and dark red mottles that are mostly plinthite; the lower part is mottled yellowish brown, strong brown, red, and light gray sandy clay loam and is about 20 percent plinthite.

The well drained Fuquay soils are on uplands. They typically have a surface layer of dark grayish brown loamy sand about 11 inches thick. The subsurface layer is loamy sand about 17 inches thick. It is light yellowish brown in the upper part and brownish yellow in the lower part. The subsoil is more than 40 inches thick. The upper part of the subsoil is brownish yellow sandy loam; the middle part is brownish yellow sandy clay loam, and the lower part is brownish yellow sandy clay loam that is about 8 to 15 percent plinthite. Mottles are strong brown, yellowish red, red, and gray.

The poorly drained Pelham soils are along branches. They typically have a surface layer of very dark gray loamy sand about 7 inches thick. The subsurface layer is loamy sand about 25 inches thick. It is light brownish gray with gray mottles in the upper part and gray with grayish brown and light brownish gray mottles in the lower part. The subsoil is more than 40 inches thick. It is gray sandy clay loam with coarse brownish yellow and yellowish brown mottles and pockets of loamy sand in places.

The soils of minor extent in the higher parts of the map unit are the well drained Bonifay, Cowarts, Carnegie, and Dothan soils. The soils of minor extent along small branches and creeks are the poorly drained Osier soils.

About 80 percent of the acreage of this map unit is used for crops. The main crops are corn, tobacco, peanuts, soybeans, small grains, hay, and pasture. Erosion is a moderate hazard on the more sloping soils. Wetness is the main limitation to the use of the soils along branches and creeks for farming and for most other purposes.

If this unit is adequately protected from erosion, in most areas it has high potential for cultivated crops and for homesites and other urban uses. It has high to medium potential for pines and hardwoods. It has high potential for development of openland wildlife habitat.

2. Leefield-Irvington-Pelham

Moderately well drained to poorly drained soils that have a loamy subsoil; on broad, low uplands and in depressions; 0 to 2 percent slopes

Areas of this map unit are mostly in the southern part of Evans County. The areas consist of nearly level, low uplands and a few oblong depressions that have no drainage outlets.

This map unit makes up about 7 percent of the county. About 44 percent of the unit is Leefield soils, 15 percent is Irvington soils, and 15 percent is Pelham soils. The rest is soils of minor extent.

Leefield soils are somewhat poorly drained and are on low uplands. They typically have a surface layer of very dark gray loamy sand about 12 inches thick. The subsurface layer is 14 inches of pale yellow loamy sand with brownish yellow mottles. The subsoil is more than 40 inches thick. The upper part of the subsoil is light yellowish brown sandy loam with brownish yellow and brownish gray mottles; the middle part is pale yellow sandy clay loam with yellowish brown, light gray, strong brown, and red mottles; and the lower part is mottled pale yellow, light gray, and brownish yellow sandy clay loam that has 8 to 15 percent plinthite in strong brown, yellowish red, and red.

The moderately well drained Irvington soils are on low uplands and have a fragipan in the subsoil. They typically have a surface layer of gray loamy sand about 8 inches thick. The subsurface layer is light yellowish brown loamy sand about 6 inches thick. The subsoil is more than 50 inches thick. The upper part of the subsoil is light yellowish brown sandy loam. The middle part is light yellowish brown sandy clay loam and is about 9 to 20 percent nodules of ironstone; it has brownish gray and red mottles and is about 6 percent plinthite. The lower part is a fragipan that is more than 30 inches thick; it is firm to brittle, mottled yellowish brown, yellowish red, red, and light gray sandy clay loam.

Pelham soils are poorly drained and are in depressions. They typically have a surface layer of very dark gray loamy sand about 7 inches thick. The subsurface layer is loamy sand about 25 inches thick. It is light brownish gray with gray mottles in the upper part and gray with grayish brown and light brownish gray mottles in the lower part. The subsoil is more than 40 inches thick. It is gray sandy clay loam with brownish yellow and yellowish brown mottles and pockets of sand in places.

The soils of minor extent are the well drained Tifton and Fuquay soils and the moderately well drained Stilson soils.

About 60 percent of the acreage of this map unit is used for crops. The cultivated areas are on low, level uplands, and the main crops are corn, tobacco, peanuts, soybeans, small grains, and pasture. The lower depressional areas are used mostly for woodland. Wetness is the main limitation to the use of the soils for cultivated crops and for most other purposes except woodland.

If this unit is adequately drained, in most areas it has high potential for cultivated crops and moderate potential for homesites and other urban uses. Wetness for long periods is a limitation to the use of Pelham soils for these purposes. This map unit has high potential for pines and moderate potential for hardwoods. It has high potential for development of woodland wildlife habitat.

3. Fuquay-Bonifay-Cowarts

Well drained soils that have a loamy subsoil; on narrow ridgetops and short, irregular, convex hillsides; mostly 1 to 8 percent slopes

This map unit is in areas scattered throughout Evans County. It is on narrow, very gently sloping ridgetops bordered by short, irregular, gentle side slopes.

This map unit makes up about 16 percent of the county. About 38 percent of the unit is Fuquay soils, 20 percent is Bonifay soils, and 17 percent is Cowarts soils. The rest is soils of minor extent.

Fuquay soils are well drained and are mostly on ridgetops. They typically have a surface layer of dark grayish brown loamy sand about 11 inches thick. The subsurface layer is loamy sand about 17 inches thick. It is light yellowish brown in the upper part and brownish yellow in the lower part. The subsoil is more than 40 inches thick. The upper part of the subsoil is brownish yellow sandy loam, the middle part is brownish yellow sandy clay loam, and the lower part is brownish yellow sandy clay loam that is 8 to 15 percent plinthite. Mottles are strong brown, yellowish red, red, and gray.

The well drained sandy Bonifay soils are on ridgetops and gentle side slopes. Bonifay soils typically have a surface layer of gray fine sand about 5 inches thick. The subsurface layer is fine sand about 52 inches thick. The upper part of the subsurface layer is light yellowish brown, the middle part is very pale brown with yellowish brown mottles, and the lower part is very pale brown and brownish yellow. The subsoil is sandy loam and sandy clay loam and is more than 23 inches thick. It is yellowish brown in the upper part, and it is brownish yellow and has light gray, yellowish red, and red mottles in the lower part. The lower part is about 8 percent plinthite.

The well drained Cowarts soils are on short, irregular side slopes on uplands. Cowarts soils typically have a surface layer of dark grayish brown loamy sand about 7 inches thick. The subsurface layer is light yellowish brown loamy sand about 4 inches thick. The upper part of the subsoil is yellowish brown sandy clay loam; the middle part is brownish yellow, friable and firm sandy clay loam that has red, yellowish red, and light gray mottles and is about 5 percent plinthite; the lower part is reticulately mottled light gray, red, and brownish yellow, firm sandy clay.

The soils of minor extent on ridgetops and gentle side slopes are the well drained Tifton, Carnegie, and Dothan soils. The soils of minor extent along small branches and creeks are the poorly drained Osier soils and the somewhat poorly drained Leefield soils.

About 50 percent of the acreage of this map unit is used for crops. The main crops are corn, tobacco, peanuts, soybeans, small grains, hay, and pasture. Erosion is a moderate to severe hazard on the more sloping soils. Wetness is the main limitation to the use of the soils along branches and creeks.

Most of this unit has medium to low potential for cultivated crops and for pines and hardwoods. It has medium to high potential for many urban uses. It has high potential for development of openland and woodland wildlife habitat.

4. Bonifay-Kershaw

Well drained and excessively drained soils that have a loamy subsoil or sandy underlying layers; mainly on broad dunelike uplands; 2 to 8 percent slopes

Areas of this map unit in Evans County are mainly adjacent to flood plains of the Canoochee River. These areas consist chiefly of broad, sandy uplands that are dissected by a few narrow drainageways.

This unit makes up about 9 percent of Evans County. About 44 percent of the unit is Bonifay soils, 35 percent is Kershaw soils, and the rest is soils of minor extent.

Bonifay soils are well drained and typically have a surface layer of gray fine sand about 5 inches thick. The subsurface layer is fine sand and is about 52 inches thick. The upper part of the subsurface layer is light yellowish brown, the middle part is very pale brown with yellowish brown mottles, and the lower part is very pale brown and brownish yellow. The subsoil is sandy loam and sandy clay loam and is more than 23 inches thick. It is yellowish brown in the upper part, and it is brownish yellow and has light gray, yellowish red, and red mottles in the lower part. The lower part is about 8 percent plinthite.

Kershaw soils are excessively drained, and in most places they are at a slightly higher elevation than the well drained Bonifay soils. Kershaw soils typically have a surface layer of dark gray sand about 3 inches thick. Below this, to a depth of 83 inches, is yellow or brownish yellow sand.

The soils of minor extent are the well drained Fuquay soils, the somewhat poorly drained Albany soils, and the very poorly drained Rutlege soils.

This unit is used mainly for pine trees. Some areas are cleared and are used for pasture. Droughtiness is the main limitation to the use of the soils for farming.

This unit has low potential for cultivated crops and pasture and low to medium potential for hardwoods and pines. It has high potential for many urban uses. The potential for development of openland and woodland wildlife habitat is low to medium.

5. Pelham-Leefield

Poorly drained and somewhat poorly drained soils that have a loamy subsoil; mainly on upland flats; 0 to 2 percent slopes

This map unit is mostly in the southern part of Evans County. The areas consist of large, nearly level upland flats that have no major drainageways.

This map unit makes up about 11 percent of the county. About 75 percent of the unit is Pelham soils, and 11 percent is Leefield soils. The rest is soils of minor extent.

Pelham soils are at a slightly lower elevation than the Leefield soils. The poorly drained Pelham soils typically have a surface layer of very dark gray loamy sand about 7 inches thick. The subsurface layer is loamy sand about 25 inches thick. It is light brownish gray with gray mottles in the upper part and gray with grayish brown and light brownish gray mottles in the lower part. The subsoil is more than 40 inches thick. It is gray sandy clay loam with coarse brownish yellow and yellowish brown mottles and pockets of loamy sand in places.

The somewhat poorly drained Leefield soils typically have a surface layer of very dark gray loamy sand about 12 inches thick. The subsurface layer is pale yellow loamy sand with brownish yellow mottles. It extends to a depth of about 26 inches. The subsoil is more than 40 inches thick. The upper part of the subsoil is light yellowish brown sandy loam with brownish yellow and brownish gray mottles; the middle part is pale yellow sandy clay loam with yellowish brown, light gray, strong brown, and red mottles; and the lower part is mottled pale yellow, light gray, and brownish yellow sandy clay loam that has 8 to 15 percent plinthite in strong brown, yellowish red, and red.

The soils of minor extent are the moderately well drained Stilson soils and the very poorly drained Ellabelle soils.

This unit is used mainly for pine trees. Most areas of this unit are in woodland (fig. 4). A few areas are cleared and are used for cultivated crops. Wetness is the main limitation to the use of the soils for farming and most other purposes. A seasonal high water table generally is within 1.5 and 2.5 feet of the surface, usually late in winter and early in spring.

If this unit is adequately drained, it has high potential for pine trees and medium potential for such cultivated crops as corn and soybeans. Pelham soils are generally too wet for urban uses. The unit has high potential for development of wetland wildlife habitat.

6. Bladen-Craven

Poorly drained and moderately well drained soils that have a clayey subsoil; on terraces and broad plains that are adjacent to major streams; 0 to 2 percent slopes

Areas of this map unit are on stream terraces and broad plains adjoining bottom lands of the Canoochee River in Evans County.

This map unit makes up about 2 percent of the county. About 50 percent of the unit is Bladen soils, and 20 percent is Craven soils. The rest is soils of minor extent.

Bladen soils are poorly drained and are at a slightly lower elevation than the Craven soils. Bladen soils typically have a surface layer of fine sandy loam about 8 inches thick. It is dark gray in the upper part and light brownish gray in the lower part. The upper part of the subsoil is gray clay, and the lower part is light gray sandy clay that extends to a depth of 64 inches.

The moderately well drained Craven soils are at the slightly higher elevations. They typically have a surface layer of gray fine sandy loam about 5 inches thick. The subsurface layer is pale brown fine sandy loam about 3 inches thick. The subsoil is about 38 inches thick. It is dominantly sandy clay and clay that is strong brown in the upper part and mottled strong brown, light gray, and red in the lower part. The underlying material to a depth of more than 68 inches is light gray sandy clay loam with yellowish brown and red mottles.

The soils of minor extent are the poorly drained Pelham and Osier soils.

This unit is used mainly for woodland. A few small areas are cleared and are used for cultivated crops. Wetness and flooding are the main limitations to the use of the soils for most purposes.

This unit has high to medium potential for wood crops. Because wetness is a severe limitation in most areas, this unit has low potential for homesites and other urban uses. It has high potential for development of wetland wildlife habitat.

7. Osier-Pelham

Poorly drained soils that have sandy underlying layers or a loamy subsoil; on flood plains and flats; 0 to 2 percent slopes

This map unit is in areas scattered throughout Evans County. It is on nearly level flood plains of large branches, creeks, and rivers.

This map unit makes up about 22 percent of the county. About 53 percent of the unit is Osier soils and 22 percent is Pelham soils. The rest is soils of minor extent.

The poorly drained Osier and Pelham soils are on flood plains and wet flats along large branches, creeks, and the Canoochee and Ohoopee Rivers. Osier soils typically have a surface layer of dark gray loamy fine sand about 6 inches thick. The subsurface layer is gray loamy sand about 6 inches thick. Below this is 28 inches

of gray sand that is underlain by 22 inches or more of light gray sand.

The poorly drained Pelham soils typically have a surface layer of very dark gray loamy sand about 7 inches thick. The subsurface layer is loamy sand about 25 inches thick. It is light brownish gray with gray mottles in the upper part and gray with grayish brown and light brownish gray mottles in the lower part. The subsoil is more than 40 inches thick. It is gray sandy clay loam with coarse brownish yellow and yellowish brown mottles and pockets of loamy sand in places.

The soils of minor extent are the moderately well drained Craven soils, the somewhat poorly drained Albany soils, the poorly drained Bladen soils, and the very poorly drained Rutlege soils.

This unit is used for trees. Flooding and wetness are the main limitations to the use of the soils as farmland and woodland and for homesites and other urban uses.

This unit has high to medium potential for trees. Because wetness and flooding are such severe limitations and so difficult to overcome, this unit has low potential for homesites and other urban uses. It has high potential for development of wetland wildlife habitat.

Tattnall County

1. Tifton-Fuquay

Well drained soils that have a loamy subsoil; on broad uplands; 0 to 8 percent slopes

This map unit is in large areas scattered throughout Tattnall County (fig. 5). It is on broad uplands. It has a well developed drainage system consisting of small drainageways that lead to branches that flow into creeks. The branches and creeks flow generally to the southeast or south. On nearly all of the soils in this unit, slope ranges from 0 to 8 percent but is mainly 0 to 5 percent.

This map unit makes up about 33 percent of the county. About 49 percent of the unit is Tifton soils and 19 percent is Fuquay soils. The rest is soils of minor extent. Tifton soils typically have a surface layer of very dark grayish brown loamy sand about 10 inches thick that has many small nodules of ironstone. The subsoil is more than 53 inches thick. The upper part of the subsoil is brownish yellow sandy loam that has nodules of ironstone; the middle part is yellowish brown sandy clay loam with strong brown, red, and dark red mottles that are mostly plinthite; and the lower part is mottled yellowish brown, strong brown, red, and light gray sandy clay loam and is about 20 percent plinthite.

Fuquay soils typically have a surface layer of dark grayish brown loamy sand about 11 inches thick. The subsurface layer is loamy sand about 17 inches thick. It is light yellowish brown in the upper part and brownish yellow in the lower part. The subsoil is more than 40 inches thick. The upper part of the subsoil is brownish yellow sandy loam, the middle part is brownish yellow sandy clay loam, and the lower part is brownish yellow sandy clay loam that is about 8 to 15 percent plinthite. Mottles are strong brown, yellowish red, red, and gray.

The soils of minor extent on the higher parts of this map unit are the sandy, well drained Bonifay soils and the well drained Cowarts, Carnegie, and Dothan soils. The soils of minor extent along small branches and creeks are the poorly drained Pelham and Osier soils and the somewhat poorly drained Leefield and Albany soils.

About 80 percent of the acreage of this map unit is used for crops. The main crops are corn, tobacco, peanuts, soybeans, small grains, hay, and pasture. Erosion is a moderate hazard on the more sloping soils. Wetness is the main limitation to the use of the soils along branches and creeks for farming and for most other purposes.

If this unit is adequately protected from erosion, in most areas it has high potential for cultivated crops and for homesites and other urban uses. The potential for trees is high to medium, and the potential for development of openland wildlife habitat is high.

2. Leefield-Irvington-Pelham

Moderately well drained to poorly drained soils that have a loamy subsoil; on broad, low uplands and in depressions; 0 to 2 percent slopes

This map unit is mostly in the central part of Tattnall County. It consists of nearly level, low uplands and a few oblong depressions that have no drainage outlets.

This map unit makes up about 9 percent of the county. About 41 percent of the unit is Leefield soils, 19 percent is Irvington soils, and 12 percent is Pelham soils. The rest is soils of minor extent.

Leefield soils are somewhat poorly drained and are on low uplands. They typically have a surface layer of dark gray loamy sand about 12 inches thick. The subsurface layer is 14 inches of pale yellow loamy sand mottled with brownish yellow. The subsoil is more than 40 inches thick. The upper part of the subsoil is light yellowish brown sandy loam with brownish yellow and brownish gray mottles; the middle part is pale yellow sandy clay loam with yellowish brown, light gray, strong brown, and red mottles; and the lower part is mottled pale yellow, light gray, and brownish yellow sandy clay loam that has 8 to 15 percent plinthite in strong brown, yellowish red, and red.

The moderately well drained Irvington soils are on low uplands and have a fragipan in the subsoil. Irvington soils typically have a surface layer of gray loamy sand about 8 inches thick. The subsurface layer is light yellowish brown loamy sand about 6 inches thick. The subsoil is more than 50 inches thick. The upper part of the subsoil is light yellowish brown sandy loam. The middle part is light yellowish brown sandy clay loam and is about 9 to 20 percent nodules of ironstone. It has

brownish gray and red mottles and is about 6 percent plinthite. The lower part of the subsoil is a fragipan that is more than 30 inches thick. It is firm to brittle, mottled yellowish brown, yellowish red, red, and light gray sandy clay loam.

Pelham soils are poorly drained and are in depressions. They typically have a surface layer of very dark gray loamy sand about 7 inches thick. The subsurface layer is loamy sand about 25 inches thick. It is light brownish gray with gray mottles in the upper part and gray with grayish brown and light brownish gray mottles in the lower part. The subsoil is more than 40 inches thick. It is gray sandy clay loam with brownish yellow and yellowish brown mottles and pockets of sand in places.

The soils of minor extent are the well drained Tifton and Fuquay soils, the moderately well drained Stilson soils, and the poorly drained Osier soils.

About 60 percent of the acreage of this map unit is used for crops. The cultivated areas are on the low, level uplands, and the main crops are corn, tobacco, peanuts, soybeans, small grains, and pasture. The lower depressional areas are used mainly for woodland. Wetness is the main limitation to the use of the soils for cultivated crops and for most other purposes except woodland.

If this unit is adequately drained, in most areas it has high potential for cultivated crops and moderate potential for homesites and other urban uses. Prolonged wetness is a limitation to the use of Pelham soils for those purposes. This unit has high potential for pines and moderate potential for hardwoods. It has high potential for development of woodland wildlife habitat.

3. Fuquay-Cowarts-Bonifay

Well drained soils that have a loamy subsoil; on narrow ridgetops and short, irregular, convex hillsides; mostly 1 to 8 percent slopes

This map unit is in areas scattered throughout the northern half of Tattnall County. It is on narrow, very gently sloping ridgetops bordered by short, irregular, gentle side slopes.

This map unit makes up about 11 percent of the county. About 38 percent of the unit is Fuquay soils, 19 percent is Cowarts soils, and 14 percent is Bonifay soils. The rest is soils of minor extent.

Fuquay soils are well drained and are mostly on ridgetops. They typically have a surface layer of dark grayish brown loamy sand about 11 inches thick. The subsurface layer is loamy sand about 17 inches thick. It is light yellowish brown in the upper part and brownish yellow in the lower part. The subsoil is more than 40 inches thick. The upper part of the subsoil is brownish yellow sandy loam, the middle part is brownish yellow sandy clay loam, and the lower part is brownish yellow sandy clay loam that is about 8 to 15 percent plinthite. Mottles are strong brown, yellowish red, red, and gray.

The well drained Cowarts soils are on short, irregular side slopes of uplands. Cowarts soils typically have a surface layer of dark grayish brown loamy sand about 7 inches thick. The subsurface layer is light yellowish brown loamy sand about 4 inches thick. The upper part of the subsoil is yellowish brown sandy clay loam; the middle part is brownish yellow, friable and firm sandy clay loam that has red, yellowish red, and light gray mottles and is about 5 percent plinthite; and the lower part is reticulately mottled light gray, red, and brownish yellow, firm sandy clay.

The well drained Bonifay soils are on ridgetops and gentle side slopes. Bonifay soils typically have a surface layer of gray fine sand about 5 inches thick. The subsurface layer is fine sand about 52 inches thick. The upper part of the subsurface layer is light yellowish brown, the middle part is very pale brown with yellowish brown mottles, and the lower part is brownish yellow. The subsoil is sandy loam and sandy clay loam and is more than 23 inches thick. It is yellowish brown in the upper part, and it is brownish yellow and has light gray, yellowish red, and red mottles in the lower part. The lower part is about 8 percent plinthite.

The soils of minor extent on ridgetops and gentle side slopes are the well drained Tifton, Carnegie, and Dothan soils. The soils of minor extent along small branches and creeks are the poorly drained Pelham and Osier soils and the somewhat poorly drained Leefield and Albany soils.

About 50 percent of the acreage of this map unit is used for crops. The main crops are corn, tobacco, peanuts, soybeans, small grains, hay, and pasture. Erosion is a moderate to severe hazard on the more sloping soils. Wetness is the main limitation to the use of the soils along branches and creeks.

Most of this unit has medium to low potential for cultivated crops and for pines and hardwoods. It has medium to high potential for many urban uses. It has high potential for development of openland and woodland wildlife habitat.

4. Kershaw-Bonifay

Excessively drained and well drained soils that have sandy underlying layers or a loamy subsoil; mainly on broad, dunelike uplands; 1 to 8 percent slopes

Areas of this map unit in Tattnall County are mainly adjacent to flood plains on the east side of the Ohoopee River. These areas consist of broad sandy uplands that are dissected by a few narrow drainageways.

This map unit makes up about 12 percent of the county. About 62 percent of the unit is Kershaw soils, and 17 percent is Bonifay soils. The rest is soils of minor extent.

Kershaw soils are excessively drained, and in most places they are at a slightly higher elevation than the well drained Bonifay soils. Kershaw soils typically have a

surface layer of dark gray sand about 3 inches thick. Below this, to a depth of 83 inches, is yellow or brownish yellow sand.

The well drained Bonifay soils typically have a surface layer of gray fine sand about 5 inches thick. The subsurface layer is fine sand about 52 inches thick. The upper part of the subsurface layer is light yellowish brown, the middle part is very pale brown with yellowish brown and brownish yellow mottles, and the lower part is brownish yellow. The subsoil is sandy loam and sandy clay loam and is more than 23 inches thick. It is yellowish brown in the upper part, and it is brownish yellow and has light gray, yellowish red, and red mottles in the lower part. The lower part is about 8 percent plinthite.

The soils of minor extent are the excessively drained Kureb soils, the somewhat poorly drained Albany soils, and the very poorly drained Rutlege soils.

This unit is used mainly for pine trees. Some areas are cleared and are used for pasture. Droughtiness is the main limitation to the use of the soils for farming.

This unit has low potential for cultivated crops and pasture and low to medium potential for pines. It has high potential for many urban uses. It has low to medium potential for development of openland and woodland wildlife habitat.

5. Pelham-Leefield

Poorly drained and somewhat poorly drained soils that have a loamy subsoil; mainly on upland flats; 0 to 2 percent slopes

Areas of this map unit are mainly in the central part of Tattnall County, east of Reidsville and north of Glennville. These areas consist of large, nearly level, upland flats that have no major drainageways.

This map unit makes up about 15 percent of the county. About 78 percent of the unit is Pelham soils, and 12 percent is Leefield soils. The rest is soils of minor extent.

Pelham soils are at a slightly lower elevation than the Leefield soils. The poorly drained Pelham soils typically have a surface layer of very dark gray loamy sand about 7 inches thick. The subsurface layer is loamy sand about 25 inches thick. It is light brownish gray with gray mottles in the upper part and gray with grayish brown and light brownish gray mottles in the lower part. The subsoil is more than 40 inches thick. It is gray sandy clay loam with coarse brownish yellow and yellowish brown mottles and pockets of loamy sand in places.

The somewhat poorly drained Leefield soils typically have a surface layer of very dark gray loamy sand about 12 inches thick. The subsurface layer is 14 inches of pale yellow loamy sand with brownish yellow mottles. The subsoil is more than 40 inches thick. The upper part of the subsoil is light yellowish brown sandy loam with brownish yellow and brownish gray mottles; the middle part is pale yellow sandy clay loam with yellowish brown, light gray, strong brown, and red mottles; and the lower part is mottled pale yellow, light gray, and brownish yellow sandy clay loam that has 8 to 15 percent plinthite in strong brown, yellowish red, and red.

The soils of minor extent are the moderately well drained Stilson soils and the very poorly drained Ellabelle soils.

This unit is used mainly for pines. A few areas are cleared and are used for cultivated crops. Wetness is the main limitation to the use of the soils for farming and most other purposes. A seasonal high water table is generally near the surface, usually late in winter and early in spring.

If this unit is adequately drained, it has high potential for pines and medium potential for such cultivated crops as corn and soybeans. Pelham soils are generally too wet for urban uses. The unit has high potential for development of wetland wildlife habitat.

6. Bladen-Craven

Poorly drained and moderately well drained soils that have a clayey subsoil; on terraces and broad plains that are adjacent to major streams; 0 to 2 percent slopes

Areas of this map unit are on stream terraces and broad plains adjoining bottom lands of the Altamaha River in Tattnall County.

This map unit makes up about 5 percent of the county. About 60 percent of the unit is Bladen soils, and 15 percent is Craven soils. The rest is soils of minor extent.

Bladen soils are poorly drained and are at a slightly lower elevation than the Craven soils. Bladen soils typically have a surface layer of fine sandy loam about 8 inches thick. It is dark gray in the upper part and light brownish gray in the lower part. The upper part of the subsoil is gray clay, and the lower part is light gray sandy clay that extends to a depth of 64 inches.

The moderately well drained Craven soils are at the slightly higher elevations. They typically have a surface layer of gray fine sandy loam about 5 inches thick. The subsurface layer is pale brown fine sandy loam about 3 inches thick. The subsoil is about 38 inches thick. It is dominantly sandy clay and clay that is strong brown in the upper part and mottled strong brown, light gray, and red in the lower part. The underlying material to a depth of more than 68 inches is light gray sandy clay loam with yellowish brown and red mottles.

The soils of minor extent are the somewhat poorly drained Albany soils, the poorly drained Pelham and Osier soils, and the very poorly drained Ellabelle soils.

This unit is used mostly for trees. A few small areas are cleared and are used for cultivated crops. Wetness and flooding are the main limitations to the use of the soils for most purposes.

This unit has high to medium potential for trees. Because wetness is a severe limitation in most areas, this unit has low potential for homesites and other urban

uses. It has high potential for development of wetland wildlife habitat.

7. Osier-Pelham

Poorly drained soils that have sandy underlying layers or a loamy subsoil; on flood plains and flats; 0 to 2 percent slopes

This map unit is in areas scattered throughout Tattnall County. It is on nearly level flood plains and flats near branches, creeks, and the Ohoopee River.

This map unit makes up about 11 percent of the county. About 65 percent of the unit is Osier soils or similar loamy soils, and 12 percent is Pelham soils. The rest is soils of minor extent.

The poorly drained Osier soils have a surface layer of dark gray loamy fine sand about 6 inches thick. The subsurface layer is gray loamy sand about 6 inches thick. Below this is 28 inches of gray sand that is underlain by 22 inches or more of light gray sand.

The poorly drained Pelham soils have a surface layer of very dark gray loamy sand about 7 inches thick. The subsurface layer is loamy sand about 25 inches thick. It is light brownish gray with gray mottles in the upper part and gray with grayish brown and light brownish gray mottles in the lower part. The subsoil is more than 40 inches thick. It is gray sandy clay loam with coarse brownish yellow and yellowish brown mottles and pockets of loamy sand in places.

The soils of minor extent are the somewhat poorly drained Albany soils, the poorly drained Bladen soils, and the very poorly drained Rutlege soils. They are on flats and flood plains of branches, creeks, and the Ohoopee River.

This unit is used for trees (fig. 6). Flooding and wetness are the main limitations to the use of the soils as farmland and woodland, and for homesites and other urban uses.

This unit has high to medium potential for pines and hardwoods. Wetness and flooding are such severe problems and so difficult to overcome that the potential for homesites and other urban uses is low. The potential for development of wetland wildlife habitat is high.

8. Wahee-Hydraquents

Somewhat poorly drained and very poorly drained soils that have a clayey subsoil or loamy to clayey underlying layers; on terraces and flood plains; 0 to 2 percent slopes

Areas of this map unit in Tattnall County are on flood plains of the Altamaha River.

This map unit makes up about 4 percent of the county. About 65 percent of the unit is Wahee soils, and 11 percent is Hydraquents. The rest is soils of minor extent.

The somewhat poorly drained Wahee soils are on broad flood plains. They typically have a surface layer of dark grayish brown loam about 3 inches thick. The subsoil is about 51 inches thick. The upper part of the subsoil is yellowish brown sandy clay loam and clay with gray mottles, the middle part is gray clay with yellowish brown mottles, and the lower part to a depth of 54 inches is gray sandy clay loam with yellowish brown mottles. The underlying material is mottled gray, light yellowish brown, and yellowish brown stratified loamy sand and sandy clay loam.

Hydraquents are in low areas and depressions on the flood plains. They have variable characteristics. In one area Hydraquents have a surface layer of dark brown silt loam, organic matter, and roots about 8 inches deep. Below this, to a depth of 28 inches, the material is gray silty clay loam that has many very fine and medium roots. The lower layer, to a depth of 60 inches or more, is gray silty clay that has many fine and very fine roots.

The soils of minor extent are poorly drained clayey soils in narrow, lower lying areas and moderately well drained sandy soils on the remants of old stream channels.

This unit is used for trees. Flooding and wetness are the main limitations to the use of the soils as farmland and woodland, and for homesites and other urban uses.

This unit has high to medium potential for trees. Wetness and flooding are such severe limitations and so difficult to overcome that the potential for homesites and other urban uses is low. The potential for development of wetland wildlife habitat is high.

Broad land use considerations

Each year considerable acreage is developed for woodland, cropland, and pasture and for urban and other related uses. The general soil map can be helpful in identifying large areas suitable for farming or other land uses. It cannot be used in selecting sites for such specific uses as urban structures.

Woodland covers about 67 percent of the three-county area. With a few exceptions, all map units have medium to high potential for woodland production. One exception is Kershaw sand, which is of major extent in the Kershaw-Bonifay unit. This soil has low potential for woodland production because of droughtiness.

Cropland and pasture make up about 33 percent of the survey area, but this acreage can be doubled. Some of the map units that have a low potential for cropland and pasture are the Kershaw-Bonifay, Osier-Pelham, and Wahee-Hydraquents map units. The Pelham soils in the Pelham-Leefield unit need either surface or subsurface drainage, or both, before they can be used as cropland.

Vegetables and other such specialty crops as onions are well suited to soils of the Tifton-Fuquay unit. The proximity of a water source for irrigation from ponds built along nearby branches make this unit suitable for such uses.

About 6,000 acres, or 1 percent of the survey area, is in urban or built-up land. This acreage seems small, but it will probably increase in the near future, especially in areas in and around Claxton, Metter, Glennville, and Reidsville. In general, about two-thirds of the land in the survey area has medium to high potential for urban development; the rest has low potential. This area is made up of Osier-Pelham, Wahee-Hydraquents, and Bladen-Craven map units and the Pelham soils of the Pelham-Leefield unit. Most of the soils in these units have a high water table or are subject to flooding each year. The soils in the Bladen-Craven unit also have a clayey, slowly permeable subsoil.

Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information for each map unit, or soil, is given in the section "Use and management of the soils."

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

The map units on the detailed soil maps represent an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

Soils that have a profile that is almost alike make up a *soil series*. Except for allowable differences in texture of the surface layer or of the underlying substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Tifton loamy sand, 0 to 2 percent slopes, is one of several phases within the Tifton series.

Some map units are made up of two or more dominant kinds of soil. Two kinds of such map units are in this survey area: soil associations and undifferentiated groups.

A *soil association* is made up of soils that are geographically associated and are shown as one unit on the map because it is not practical to separate them. A soil association has considerable regularity in geographic pattern and in the kinds of soil that are a part of it. The extent of the soils can differ appreciably from one delineation to another; nevertheless, interpretations can be made for use and management of the soils. Wahee Association is the only soil association in this survey area.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because there is little value in separating them. The pattern and proportion of the soils are not uniform. An area shown on the map has at least one of the dominant (named) soils or may have all of them. Osier soils is the only undifferentiated group in this survey area.

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 4, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of tables.") Many of the terms used in describing soils are defined in the Glossary.

AdA—Albany sand, 0 to 2 percent slopes. This is a deep, somewhat poorly drained, nearly level soil of the Coastal Plain. Individual areas are 5 to 50 acres in size.

Typically, the surface layer is dark grayish brown sand about 7 inches thick. The subsurface layer is sand and extends to a depth of 47 inches. It is pale brown and has a few dark grayish brown mottles in the upper 5 inches, and below this it is light yellowish brown and has strong brown, light brownish gray, and yellowish brown mottles. The subsoil is brownish yellow sandy clay loam with strong brown, light brownish gray, and light gray mottles and extends to a depth of 72 inches or more.

This soil is low in natural fertility and in organic-matter content. It is very strongly acid throughout except where the surface layer has been limed. Permeability is rapid in the sandy surface and subsurface layers and is moderate in the lower part of the subsoil. Available water capacity is low. A seasonal high water table generally is

within 12 to 30 inches of the surface late in winter and early in spring. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are soils that are similar to this Albany soil and are sandy to a depth of more than 80 inches. Also included are a few areas of Pelham soils. Areas of included soils make up about 10 to 15 percent of the map unit and are less than 2 acres in size.

This soil has medium potential for corn, soybeans, tobacco, peanuts, small grains, hay, and pasture. Its potential is limited by the seasonal high water table. Excess wetness is a moderate limitation, but use of a well designed drainage system helps to overcome wetness. The use of cover crops and the return of crop residue to the soil are practices that help to maintain good tilth.

This soil has medium potential for loblolly pine, slash pine, and longleaf pine. Seedling mortality and equipment limitations are moderate.

This soil has low potential for many urban uses. Wetness is the main limitation but can be greatly reduced by installation of a good drainage system and by using a proper design for the intended use.

This soil is in capability subclass IIIw and woodland suitability group 3w.

Bk—Bladen fine sandy loam. This deep, poorly drained, nearly level soil is on Coastal Plain lowlands. Slopes are slightly undulating. Individual areas are 25 to 300 acres in size.

Typically, the surface layer is fine sandy loam about 8 inches thick. It is dark gray in the upper 4 inches and light brownish gray in the lower part. The subsoil extends to a depth of 64 inches. It is gray clay to a depth of 22 inches, and the lower part is light gray sandy clay.

This soil is low in natural fertility and in organic-matter content. It is very strongly acid throughout except where the surface layer has been limed. Permeability is slow, and available water capacity is medium. This soil has fair to good tilth. The root zone is determined mainly by the depth to the water table during the growing season.

Included with this soil in mapping are soils that are similar to this Bladen soil but have a combined surface layer and subsoil less than 60 inches thick and underlain by sand. Also included are a few small areas of Craven and Pelham soils. Areas of included soils make up about 10 to 20 percent of the map unit and are generally less than 2 acres in size.

This soil has low potential for row crops, small grains, and pasture plants. Its potential is limited by a seasonal high water table that is within 1 foot of the surface about 6 months each year. Most areas are subject to flooding each year.

This soil has high potential for loblolly pine, slash pine, and American sycamore. The high water table and risk of flooding are severe equipment limitations and increase seedling mortality.

This soil has low potential for most urban uses. The high water table and susceptibility to flooding are severe limitations for most uses. These limitations can be partly overcome by installation of a drainage system.

This soil is in capability subclass Vw and woodland suitability group 2w.

BoC—Bonifay fine sand, 1 to 8 percent slopes. This deep, well drained, gently sloping soil is on narrow to broad ridges of the Coastal Plain uplands. Slopes are smooth and mostly convex. Individual areas are 10 to 100 acres in size.

Typically, the surface layer is gray fine sand about 5 inches thick. The subsurface layer is fine sand and extends to a depth of about 57 inches. It is light yellowish brown to a depth of 5 inches, very pale brown with yellowish brown mottles to a depth of 36 inches, very pale brown with brownish yellow mottles to a depth of 54 inches, and brownish yellow below this. The subsoil is sandy loam and sandy clay loam and extends to a depth of 80 inches or more. The upper part of the subsoil is yellowish brown, and the lower part is brownish yellow with light gray, yellowish red, and red mottles. The lower part is also about 8 percent plinthite.

This soil is very low in natural fertility and low in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil. Available water capacity is low. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are some soils that are sandy to a depth of more than 80 inches. Also included are a few intermingled areas of Fuquay soils and soils that are similar to the Bonifay soil and have no plinthite. Areas of included soils make up about 10 to 15 percent of the map unit and are generally less than 2 acres in size.

This soil has low potential for row crops and small grains. It has medium potential for hay and pasture. Low available water capacity is a limitation. Large additions of organic material are needed to increase available water capacity and productivity. Minimum tillage and the use of cover crops—including grasses and legumes—in the cropping system help to increase the content of organic matter.

This soil has medium potential for loblolly pine and slash pine. Low available water capacity is a limitation.

Seedling mortality is moderate. Seedlings need to be planted on a low seedbed in winter or early in spring when the moisture content is generally higher. The limitation for the use of equipment is moderate. Moisture

improves the capability of this soil to support harvest equipment.

This soil has high potential for most urban uses. Because of the low available water capacity, good water supply should be available if this soil is used for lawns or gardens.

This soil is in capability subclass IVs and woodland suitability group 3s.

BoD—Bonifay fine sand, 8 to 12 percent slopes. This deep, well drained, strongly sloping soil is on short, convex side slopes adjacent to streams and flood plains of the Coastal Plain uplands. Individual areas are 10 to 30 acres in size.

Typically, the surface layer is dark grayish brown fine sand about 6 inches thick. The subsurface layer is pale yellow fine sand to a depth of 54 inches. The subsoil is sandy clay loam and extends to a depth of more than 100 inches. It is brownish yellow in the upper part and mottled yellowish brown, brownish yellow, red, and light gray in the lower part. The lower part of the subsoil is about 5 to 10 percent plinthite.

This soil is very low in natural fertility and low in organic-matter content. It is very strongly acid throughout except where the surface layer has been limed. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil. Available water capacity is low. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are soils that are sandy to a depth of more than 80 inches. Areas of included soils make up about 10 to 15 percent of the map unit and are generally less than 2 acres in size.

This soil has low potential for row crops, small grains, and pasture. Low available water capacity and short, strong slopes are limitations.

This soil has medium potential for loblolly pine and slash pine. Low available water capacity is a limitation. Seedling mortality is moderate. Seedlings need to be planted on a low seedbed late in winter and early in spring when the moisture content is generally higher. The limitation for the use of equipment is moderate. Moisture improves the capability of this soil to support harvest equipment.

This soil has medium potential for most urban uses because it is strongly sloping. Because of the low available water capacity, good water supply should be available if this soil is used for gardens or lawns.

This soil is in capability subclass VIs and woodland suitability group 3s.

CaC2—Carnegie sandy loam, 5 to 8 percent slopes, eroded. This deep, well drained, gently sloping soil is on short, irregular, complex side slopes of the Coastal Plain uplands. The original surface layer has been thinned by erosion. The plow layer extends into the upper part of the subsoil, and there are patches where the strong brown to yellowish brown sandy clay loam is exposed. A few shallow gullies and rills have formed in some areas. Individual areas are 5 to 20 acres in size.

Typically, the surface layer is brown sandy loam about 6 inches thick and contains many nodules of ironstone. The subsoil extends to a depth of more than 65 inches. The upper part of the subsoil is strong brown sandy clay loam; the middle part is yellowish brown sandy clay loam with strong brown and a few red and dark red mottles and is about 3 percent plinthite; and the lower part is mottled yellowish brown, dark red, light gray, and brownish yellow, firm sandy clay loam.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderately slow, and available water capacity is medium. This soil has fair to good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is somewhat restricted at a depth of about 18 to 24 inches by the firm subsoil. Included with this soil in mapping are small areas of Cowarts soils.

This soil has low potential for row crops and small grains and medium potential for hay and pasture. Thin topsoil and short, irregular slopes are limitations. Good tilth can be maintained by returning crop residue to the soil. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, terracing, and the use of cover crops—including grasses and legumes—in the cropping system help to reduce runoff and control erosion.

This soil has high potential for slash pine and loblolly pine. It has no significant limitations for woodland use and management.

This soil has medium potential for many urban uses, but the slow percolation rate is a limitation to the use of this soil for septic tank absorption fields.

This soil is in capability subclass IVe and woodland suitability group 2o.

CaD2—Carnegie sandy loam, 8 to 12 percent slopes, eroded. This deep, well drained, strongly sloping soil is on short, irregular, convex side slopes of the Coastal Plain uplands. The original surface layer has been thinned by erosion, and there are patches where the subsoil of strong brown to yellowish brown sandy clay loam is exposed. A few shallow gullies and rills have formed in some areas. Individual areas are 5 to 15 acres in size.

Typically, the surface layer is dark brown sandy loam about 5 inches thick and has common nodules of ironstone. The subsoil extends to a depth of more then 60 inches. The upper part of the subsoil is strong brown sandy clay loam and has nodules of ironstone; the middle part is strong brown sandy clay loam with red, yellow, and pale yellow mottles and is about 4 percent plinthite; and the lower part is mottled strong brown,

yellow, red, light gray, and very pale brown sandy clay loam and is about 2 percent plinthite.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderately slow, and available water capacity is medium. This soil has fair to good tilth. The root zone is deep and is somewhat restricted at a depth of about 12 to 20 inches by the firm subsoil.

Included with this soil in mapping are soils that are similar to this Carnegie soil but have sandy clay in the lower part of the subsoil. Also included are a few areas of Cowarts soils. Areas of included soils make up about 5 to 10 percent of this unit and are generally less than 2 acres in size.

This soil has low potential for row crops and small grains. The thin topsoil and short, steep slopes are limitations. This soil has medium potential for hay and pasture. Erosion is a severe hazard if cultivated crops are grown.

This soil has high potential for slash pine and loblolly pine. It has no significant limitations for woodland use and management.

This soil has medium potential for many urban uses because slope is a moderate limitation. A slow percolation rate in the firm, slightly cemented subsoil is a severe limitation to the use of this soil for septic tank absorption fields.

This soil is in capability subclass VIe and woodland suitability group 2o.

CoB—Cowarts loamy sand, 2 to 5 percent slopes. This deep, well drained, very gently sloping soil is on irregular ridgetops of the Coastal Plain uplands. Individual areas are 5 to 30 acres in size.

Typically, the surface layer is dark grayish brown loamy sand about 5 inches thick. The subsoil extends to a depth of more than 60 inches. The upper few inches of the subsoil is yellowish brown sandy clay loam; the middle part is firm yellowish brown or mottled sandy clay loam with yellowish red, brownish yellow, red, and brownish gray mottles and is about 5 percent plinthite; and the lower part is mottled yellowish brown, light gray, and red sandy clay loam.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the solum and slow in the lower part. Available water capacity is medium. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is moderately deep and is somewhat restricted at a depth of about 16 to 24 inches by the firm subsoil and content of plinthite.

Included with this soil in mapping are soils that are similar to this Cowarts soil but have a subsoil of sandy clay. Also included are a few areas of Carnegie and Dothan soils. Areas of included soils make up about 5 to 10 percent of the map unit and are mostly less than 2 acres in size.

This soil has medium potential for corn, peanuts, tobacco, soybeans, and small grain, but high yields can be obtained. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, terracing, and the use of cover crops—including grasses and legumes—in the cropping system help to reduce runoff and control erosion.

This soil has high potential for loblolly pine and slash pine. It has no significant limitations for woodland use and management.

This soil has high potential for many urban uses, but a slow percolation rate is a severe limitation to the use of this soil for septic tank absorption fields. Slope is a limitation for some uses.

This soil is in capability subclass IIe and woodland suitability group 2o.

CoC—Cowarts loamy sand, 5 to 8 percent slopes. This deep, well drained, gently sloping soil is on short, irregular, convex side slopes of the Coastal Plain uplands. Individual areas are 5 to 30 acres in size.

Typically, the surface layer is dark grayish brown loamy sand about 7 inches thick. The subsurface layer is light yellowish brown loamy sand about 4 inches thick. The subsoil extends to a depth of 70 inches. The upper part of the subsoil is yellowish brown sandy clay loam; the middle part is brownish yellow or mottled, friable and firm sandy clay loam that has red, yellowish red, and light gray mottles and is about 5 percent plinthite; and the lower part is mottled light gray, red, and brownish yellow, firm sandy clay.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the surface layer and the upper part of the subsoil, and it is slow in the lower part of the subsoil. Available water capacity is medium. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is moderately deep and is somewhat restricted at a depth of about 16 to 24 inches by the firm and plinthic subsoil.

Included with this soil in mapping are soils in eroded areas that are similar to this Cowarts soil but have a sandy clay loam or sandy loam surface layer less than 7 inches thick. Also included are a few areas of Carnegie soils. Areas of included soils make up about 5 to 10 percent of the map unit and generally are less than 2 acres in size.

This soil has medium potential for corn, peanuts, tobacco, soybeans, and small grains. It has high potential for hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if cultivated crops are grown. Minimum tillage and

the use of cover crops—including grasses and legumes—in the cropping system help to reduce runoff and control erosion.

This soil has high potential for loblolly pine and slash pine. It has no significant limitations for woodland use and management.

This soil has medium potential for many urban uses because of slope. A slow percolation rate in the firm, slightly cemented subsoil is a severe limitation to the use of this soil for septic tank absorption fields.

This soil is in capability subclass IIIe and woodland suitability group 2o.

CrA—Craven fine sandy loam, 0 to 1 percent slopes. This deep, moderately well drained, nearly level soil is on slightly elevated surfaces of the Coastal Plain lowlands. Slopes are smooth. Individual areas are 5 to 50 acres in size.

Typically, the surface layer is gray fine sandy loam about 5 inches thick. The subsurface layer is pale brown fine sandy loam about 3 inches thick. The subsoil extends to a depth of about 46 inches. The upper part is yellowish brown sandy clay loam to a depth of 11 inches. Below that, to a depth of 14 inches is strong brown sandy clay. Next, to a depth of 38 inches is strong brown clay, and below this, to a depth of 46 inches, is mottled strong brown, light gray, and red sandy clay. The underlying material, to a depth of more than 68 inches, is light gray sandy clay loam with yellowish brown and red mottles.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is slow, and available water capacity is medium. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots. A seasonal high water table is within 2 to 3 feet of the surface late in winter and early in spring.

Included with this soil in mapping are soils that are similar to this Craven soil but have a clayey subsoil that extends to a depth of more than 60 inches. Also included are a few areas of Bladen soils. Areas of included soils make up about 5 to 15 percent of the map unit and generally are less than 2 acres in size.

This soil has medium potential for tobacco, corn, soybeans, small grains, and pasture. Because water moves slowly through the subsoil, tile drainage is not effective, but the use of a system of main and lateral ditches helps to improve drainage by removing surface water.

This soil has medium potential for loblolly pine and slash pine. The seasonal high water table is a moderate limitation to the use of equipment in woodland operations.

This soil has low potential for most urban uses. The seasonal high water table and slowly permeable subsoil are moderate or severe limitations. Some of these limitations can be overcome by the installation of a well designed system of main and lateral ditches.

This soil is in capability subclass IIw and woodland suitability group 3w.

DoA—Dothan loamy sand, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on ridgetops of the Coastal Plain uplands. Slopes are smooth and slightly convex. Individual areas are 10 to 50 acres in size.

Typically, the surface layer is dark grayish brown loamy sand about 8 inches thick. The subsurface layer is light yellowish brown loamy sand about 5 inches thick. The subsoil extends to a depth of more than 74 inches. The upper few inches of the subsoil is brownish yellow sandy loam; the middle part is yellowish brown sandy clay loam; and the lower part is brownish yellow sandy clay loam with mottles of yellowish brown, yellowish red, red, and light gray.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil but is moderately slow in the lower part. Available water capacity is medium. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few intermingled areas of Tifton soils. Areas of included soils make up about 5 to 10 percent of the map unit and are less than 2 acres in size.

This soil has high potential for tobacco, peanuts, corn, soybeans, small grain, and pasture. Good tilth is easily maintained. This soil can be cultivated year after year if it is managed well. It has high potential for slash pine and loblolly pine and no limitations for woodland use and management.

This soil also has high potential for urban uses.

This soil is in capability class I and woodland suitability group 2o.

DoB—Dothan loamy sand, 2 to 5 percent slopes. This deep, well drained, very gently sloping soil is on ridgetops and hillsides of the Coastal Plain uplands. Slopes are smooth and convex. Individual areas are 5 to 40 acres in size.

Typically, the surface layer is grayish brown loamy sand about 7 inches thick. The subsurface layer is light yellowish brown loamy sand about 3 inches thick. The subsoil extends to a depth of more than 70 inches. The upper few inches of the subsoil is yellowish brown sandy loam; the middle part is yellowish brown sandy clay loam; and the lower part is brownish yellow sandy clay loam that has yellowish red, dark reddish brown, light red, and light gray mottles and is more than 5 percent plinthite.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil but is moderately slow in the lower part. Available water capacity is medium. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few intermingled areas of Tifton soils. Areas of included soils make up about 5 to 10 percent of the map unit and are less than 2 acres in size.

This soil has high potential for tobacco, peanuts, corn, soybeans, hay, and pasture. Good tilth is easily maintained. Erosion is a moderate hazard if cultivated crops are grown. Minimum tillage and the use of cover crops—including grasses and legumes—in the cropping system help to reduce runoff and control erosion.

This soil has high potential for slash pine and loblolly pine. It has no limitations for woodland use and management. It also has high potential for urban uses.

This soil is in capability subclass IIe and woodland suitability group 2o.

Em—Ellabelle loamy sand. This deep, very poorly drained, nearly level soil is in slight depressional areas of the Coastal Plain. Slopes are concave. Individual areas are 5 to 40 acres in size.

Typically, the surface layer is covered with about 1 inch of dark gray, partly decomposed leaves and straw. The surface layer is black loamy sand about 27 inches thick. The subsurface layer is light brownish gray loamy sand about 10 inches thick. The subsoil extends to a depth of more than 65 inches. It is gray sandy clay loam with strong brown and yellowish brown mottles.

This soil is low in natural fertility. It is medium to high in organic-matter content in the surface layer. It is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and available water capacity is low. The water table is at or near the surface for about 6 months or more each year. This soil is frequently flooded for long periods each year. It has good tilth, but wetness limits the period of time that it can be worked. The root zone is deep and is easily penetrated by water-tolerant plant roots.

Included with this soil in mapping are soils that are similar to this Ellabelle soil but have a black loamy sand surface layer that is less than 23 inches thick. Also included are a few intermingled areas of Pelham soils. Areas of included soils make up about 10 to 15 percent of the map unit and generally are less than 2 acres in size.

This soil has low potential for row crops, small grains, hay and pasture. Flooding and a seasonal high water table are limitations. If adequately drained, this soil has medium potential for corn and bahiagrass.

This soil has high potential for loblolly pine and slash pine if it is adequately drained. Seedling mortality and the hazard of using equipment are severe limitations but can be partly overcome by the use of a well designed drainage system.

This soil has low potential for urban uses. Flooding and wetness are limitations, but they can be overcome by major flood control and drainage measures.

This soil is in capability subclass Vw and woodland suitability group 2w.

FsB—Fuquay loamy sand, 1 to 5 percent slopes. This deep, well drained, very gently sloping soil is on broad ridgetops of the Coastal Plain uplands. Slopes are smooth and convex. Individual areas are 3 to 50 acres in size.

Typically, the surface layer is dark grayish brown loamy sand about 11 inches thick. The subsurface layer is about 17 inches thick. It is light yellowish brown in the upper part and brownish yellow in the lower part. The subsoil extends to a depth of more than 68 inches. The upper part is brownish yellow sandy loam to a depth of 33 inches. Below this, to a depth of 46 inches, is brownish yellow sandy clay loam. Next, to a depth of 68 inches, is brownish yellow sandy clay loam that is about 8 to 15 percent plinthite. Mottles are strong brown, yellowish red, red, and gray.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil but is slow in the lower part. Available water capacity is low. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are soils that are similar to this Fuquay soil but have more than 5 percent nodules of ironstone in the surface layer and in the upper part of the subsoil. Areas of included soils make up about 10 to 15 percent of the map unit and are less than 2 acres in size.

This soil has medium potential for corn, tobacco, soybeans, peanuts, small grains, hay, and pasture. Low available water capacity in the thick sandy surface layer is a limitation. Good tilth is easily maintained by returning crop residue to the soil. Minimum tillage and the use of cover crops—including grasses and legumes—in the cropping system help to increase the content of organic matter and the available water capacity.

This soil has medium to high potential for slash pine and loblolly pine. It has no significant limitations for woodland use and management.

This soil has high potential for many urban uses. A slow percolation rate in the lower part of the subsoil is a moderate limitation to the use of this soil for septic tank absorption fields. This limitation generally can be over-

come by increasing the size of the absorption area or by modifying the filter field.

This soil is in capability subclass IIs and woodland suitability group 3s.

FsC—Fuquay loamy sand, 5 to 8 percent slopes. This deep, well drained, gently sloping soil is on sides of broad ridges of the Coastal Plain uplands. Slopes are generally short and convex. Individual areas are 3 to 20 acres in size.

Typically, the surface layer is dark gray loamy sand about 4 inches thick. The subsurface layer is loamy sand about 22 inches thick. It is light yellowish brown in the upper part and pale yellow in the lower part. The subsoil extends to a depth of more than 70 inches. The upper part is brownish yellow sandy loam to a depth of 29 inches. Below this, to a depth of 44 inches, is brownish yellow sandy clay loam with common reddish yellow mottles in the lower part. The lower part of the subsoil to a depth of 70 inches is mottled yellowish brown, yellow, and light gray sandy clay loam and is about 12 to 15 percent firm, red plinthite.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is slow. Available water capacity is low. This soil has good tilth and can be worked throughout a wide range of moisture content: The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are small areas of Tifton and Dothan soils.

This soil has medium potential for row crops, small grains, hay, and pasture. Low available water capacity in the thick loamy sand surface layer and gentle slopes are limitations. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if cultivated crops are grown. Minimum tillage and the use of cover crops—including grasses and legumes—in the cropping system help to reduce runoff, control erosion, and increase the content of organic matter.

This soil has medium to high potential for slash pine and loblolly pine. It has no significant limitations for woodland use and management.

This soil has medium potential for many urban uses. A slow percolation rate in the subsoil, in areas where the plinthic layer is within 34 to 40 inches of the surface, is a moderate limitation to the use of this soil for septic tank absorption fields. This limitation can generally by overcome by increasing the size of the absorption area or by modifying the filter field.

This soil is in capabiality subclass IIIe and woodland suitability group 3s.

Hz—Hydraquents. These soft, swampy soils are in low level areas and depressions on the flood plain of the Altamaha River. They are too variable and too difficult to examine in detail to classify at the series level. Areas are irregularly shaped and are 30 to 400 acres in size. Floodwaters reach a height of 6 feet during rainy periods that generally occur late in winter and early in spring. Because of the low position of the areas, floodwater stands on these soils nearly all year. These soils generally are too soft and too wet to support large farm animals.

Hydraquents have variable characteristics. In one area the surface layer is dark brown silt loam and organic matter about 8 inches thick. Below this, to a depth of 28 inches, the material is gray silty clay loam with many very fine and medium roots. Below that, to a depth of 60 inches or more, is gray silty clay with many fine and very fine roots.

Included with these soils in mapping are small areas of Wahee soils, small areas covered by sandy material washed from the uplands, and small areas of peat and muck.

All of the acreage is in bottom land hardwoods. Dominant overstory species are water-tupelo, cypress, sweet bay, and blackgum and a few swamp maple. The understory is mostly water-tolerant shrubs and aquatics.

Flooding and the softness of these soils make them unsuitable for grazing or for cultivated crops and pasture. The soils are well suited as habitat for ducks, alligator, crayfish, and other wetland wildlife.

This soil is in capability subclass VIIw. It is not assigned to a woodland suitability group.

IgA—Irvington loamy sand, 0 to 2 percent slopes. This deep, moderately well drained, nearly level soil is on smooth uplands of the Coastal Plain. Slopes are slightly concave. Individual areas are 5 to 30 inches thick.

Typically, the surface layer is gray loamy sand about 8 inches thick. The subsurface layer is light yellowish brown sand about 6 inches thick. The subsoil extends to a depth of more than 64 inches. The upper part is light yellowish brown sandy loam to a depth of 21 inches. Below this, to a depth of 30 inches, is light yellowish brown sandy clay loam that has about 20 percent nodules of ironstone. Below that, to a depth 34 inches, is light yellowish brown sandy clay loam with light brownish gray and red mottles and about 6 percent nodules of ironstone. The next layer is a fragipan that extends to a depth of more than 64 inches. The fragipan is firm to brittle, mottled yellowish brown, yellowish red, red, and light gray sandy clay loam.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. This soil has good tilth. Permeability is slow, and available water capacity is medium. The root zone is generally moderately deep and is easily penetrated by plant roots.

Included with this soil in mapping are soils that are similar to this Irvington soil, but the fragipan is firm and brittle in less than 60 percent by volume. Areas of in-

cluded soils make up about 10 to 15 percent of the map unit.

This soil has medium potential for row crops, small grains, hay and pasture. A perched seasonal water table about 30 inches below the surface and above the fragipan is a limitation. Good tilth is easily maintained by returning crop residue to the soil. A system of main and lateral ditches or subsurface tile drains help to improve drainage.

This soil has high potential for loblolly pine and slash pine. It has no significant limitations for woodland use and management.

This soil has medium potential for many urban uses. The seasonal high water table is a severe limitation to the use of this soil for septic tank absorption fields and a moderate limitation to some other urban uses. Most of these limitations can be overcome by installing a well designed system of main and lateral ditches or subsurface tile drains to lower the water table.

This soil is in capability unit IIw and woodland suitability group 2w.

KeC—Kershaw sand, 2 to 8 percent slopes. This deep, excessively drained, gently sloping, sandy soil is on broad ridges and dunelike landscapes of the Coastal Plain near the major streams. Slopes are generally smooth and convex. Individual areas are 30 acres to several hundred acres in size.

Typically, the surface layer is dark gray sand about 3 inches thick. Below this to a depth of 83 inches is yellow or brownish yellow sand.

This soil is very low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is very rapid. Available water capacity is very low. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are small areas of Kureb soils.

This soil has low potential for row crops, small grains, hay, and pasture. Droughtiness is a limitation. Hay and pasture can be grown under careful management.

This soil has low potential for trees; however, this is one of the better uses (fig. 7). Seedling mortality is severe. Trees need to be planted during periods of highest rainfall, which is generally late in winter and early in spring. Sand pine, slash pine, and longleaf pine are favored when this soil is planted to trees.

This soil has high potential for many urban uses. Because of the poor filtering action of this soil, septic tank absorption fields should not be placed near streams or wells.

This soil is in capability subclass VIIs and woodland suitability group 5s.

KuD—Kureb sand, 5 to 12 percent slopes. This deep, excessively drained, gently sloping to sloping, sandy soil is on side slopes of ridges and edges of bays of the Coastal Plain uplands. Slopes are smooth to convex. Individual areas are 10 to 40 acres in size.

Typically, the surface layer is covered with about 1 inch of decaying leaves and twigs and matted fine and very fine roots. The surface layer is very dark gray sand about 4 inches thick. Below this, to a depth of 38 inches, is white sand. Beneath this, to a depth of 46 inches, is yellowish brown sand that has dark brown mottles and a brown organic coating on sand grains. The next layer, to a depth of more than 80 inches, is sand. It is light yellowish brown in the upper part and very pale brown, mottled with brownish yellow in the lower part.

This soil is very low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout. Permeability is rapid, and available water capacity is very low. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are soils that are similar to this Kureb soil but do not have the layer with organic coatings on sand grains. Areas of included soils make up about 5 to 10 percent of the map unit.

This soil has low potential for row crops, small grain, hay, and pasture. Droughtiness is a limitation. Hay and pasture can be grown under careful management.

This soil has low potential for trees; however, this is one of the better uses. Because of droughtiness, seedling mortality is severe. Trees need to be planted on a low seedbed late in winter or early in spring when the moisture content is highest.

This soil has medium to high potential for many urban uses. Because of the poor filtering action of this soil, septic tank absorption fields should not be placed near streams or wells.

This soil is in capability subclass VIIs and woodland suitability group 5s.

Le—Leefield loamy sand. This deep, somewhat poorly drained, nearly level soil is on low uplands of the Coastal Plain. The seasonal high water table is generally within 18 to 30 inches of the surface late in winter and early in spring. Individual areas are 10 to 50 acres in size.

Typically, the surface layer is very dark gray loamy sand about 12 inches thick. The subsurface layer extends to a depth of 26 inches and is pale yellow loamy sand with brownish yellow mottles. The subsoil extends to a depth of more than 66 inches. The upper part is light yellowish brown sandy loam with yellowish brown and light brownish gray mottles to a depth of 30 inches. The next layer, to a depth of 46 inches, is light yellowish brown sandy clay loam with yellowish brown, light gray, strong brown, and red mottles. The lower part of the

subsoil is mottled pale yellow, yellowish red, light gray, and brownish yellow sandy clay loam to a depth of more than 66 inches.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and is moderately slow through the plinthic layer. Available water capacity is medium. This soil has good tilth and can be worked throughout a fairly wide range of moisture content. The root zone is deep and is easily penetrated by plant roots if adequate drainage is provided.

Included with this soil in mapping are soils that have less than 5 percent plinthite within 60 inches of the surface. Areas of included soils make up about 10 to 15 percent of the map unit and are generally less than 2 acres in size.

This soil has medium potential for corn, tobacco, soybeans, small grain, hay, and pasture. Wetness is a limitation. Good tilth is easily maintained by returning crop residue to the soil. A well designed system of main and lateral ditches or subsurface tile drains can help to improve drainage.

This soil has medium to high potential for loblolly pine and slash pine. It has no severe limitations for woodland use and management.

This soil has low potential for many urban uses. The seasonal high water table is the main limitation, but it can generally be overcome by installing a well designed system of main and lateral ditches or subsurface tile drains. The water table needs to be lowered significantly before septic tank absorption fields can function properly.

This soil is in capability subclass IIw and woodland suitability group 3w.

OS—Osier soils. This map unit is made up of poorly drained, nearly level soils on flood plains of small to large streams. It is flooded 2 or more times each year. It mainly consists of Osier soils, but other closely associated soils are in an irregular pattern within the mapped areas.

Individual areas of Osier soils are large enough to map separately, but because of present and predicted use, they were not separated from the closely associated soils in mapping. Slopes are less than 2 percent. Individual areas are 20 to more than 80 acres in size. A typical area of this map unit is about 70 percent Osier soils and about 30 percent other loamy soils.

Typically, Osier soils have a surface layer of dark gray loamy fine sand about 6 inches thick. The subsurface layer is gray loamy sand about 6 inches thick. Below this, to a depth of 40 inches, is gray sand that is underlain to a depth of 62 inches or more by light gray sand.

Osier soils are strongly acid or very strongly acid throughout. Permeability is rapid. Available water capacity is mostly low, though a seasonal high water table generally is within 12 inches of the surface during winter and spring. These soils are low in natural fertility, and they are medium in organic-matter content in the surface layer. The root zone is deep for water-tolerant plants.

This map unit is wooded. It has medium potential for loblolly pine and slash pine. Wetness is the main limitation to equipment use. This limitation can be overcome by using special equipment or by logging during the drier seasons. Because of flooding, seedling mortality is severe.

This map unit has very low potential for farming and for urban uses. Wetness and flooding are the main limitations, but they can be overcome by major flood control and drainage measures.

This soil is in capability subclass Vw and woodland suitability group 3w.

Pe—Pelham loamy sand. This deep, poorly drained, nearly level soil is on broad flats and in depressions and small drainageways. Individual areas are 10 to 40 acres in size in the depressions and small drainageways and as much as several hundred acres in size on the broad flats.

Typically, the surface layer is very dark gray loamy sand about 7 inches thick. The subsurface layer is loamy sand about 25 inches thick. It is light brownish gray with gray mottles in the upper part and gray with grayish brown and light brownish gray mottles in the lower part. The subsoil extends to a depth of more than 72 inches. It is gray sandy clay loam that has coarse brownish yellow and yellowish brown mottles and pockets of loamy sand in places.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate. Available water capacity is low, but the seasonal high water table is within 6 to 18 inches of the surface late in winter and early in spring. This soil has good tilth but can only be worked if the water table is adequately lowered. The root zone is deep and is easily penetrated by plant roots if the water table is adequately lowered.

Included with this soil in mapping are soils that have sand to a depth of more than 40 inches. Also included are a few areas of Osier soils. Areas of included soils make up about 10 to 15 percent of the map unit and are generally less than 2 acres in size.

This soil has low potential for row crops and small grain if it is undrained. The seasonal high water table is a limitation. A well designed system of main and lateral ditches or subsurface drains can greatly improve drainage. Good tilth can be easily maintained by returning crop residue to the soil.

This soil has high potential for loblolly pine and slash pine. Wetness is the main limitation to equipment use. This limitation can be overcome by using special equipment or by logging during the drier seasons. Because of

the wetness of this soil, seedling mortality is severe. Seedlings need to be planted on a high seedbed.

This soil has low potential for most urban uses. Wetness is the main limitation. This limitation can be overcome by installing a well designed system of main and lateral ditches or subsurface drains if outlets are available. The water table needs to be lowered significantly if septic tank absorption fields are to function properly.

This soil is in capability subclass Vw and woodland suitability group 2w.

Ru—Rutlege sand. This deep, very poorly drained, nearly level soil is in bays and depressions of the Coastal Plain. Individual areas are 10 to 40 acres in size.

Typically, the surface layer is covered with about 3 inches of organic matter. The surface layer is very dark gray and very dark grayish brown sand about 38 inches thick. The underlying layer is light brownish gray sand that extends to a depth of more than 70 inches.

This soil is low in natural fertility. It is high in organic-matter content in the surface layer. It is very strongly acid or extremely acid throughout. Permeability is rapid. Available water capacity is low. The soil, however, is frequently flooded for periods of 1 month or more, and the water table is within 15 inches of the surface more than 6 months each year. This soil has good tilth during dry seasons, but it can only be farmed satisfactorily if the water table is well below the surface. The root zone is deep and is easily penetrated by the plant roots of water-tolerant species.

Included with this soil in mapping are soils that are similar to this Rutlege soil but have black underlying layers.

This soil is wooded. It has high potential for loblolly pine and slash pine. Wetness is the main limitation to equipment use. This limitation can be overcome by using special equipment or by logging during the drier seasons. Because of flooding and wetness in this soil, seedling mortality is severe. Seedlings need to be planted on a high seedbed.

This soil has very low potential for farming and for urban uses. Wetness and flooding are the main limitations. These limitations can be overcome by major flood control and drainage measures.

This soil is in capability subclass VIw and woodland suitability group 2w.

Se—Stilson loamy sand. This deep, moderately well drained, nearly level soil is on broad, low uplands of the Coastal Plain. The seasonal high water table is within 2.5 to 3 feet of the surface late in winter and early in spring. Individual areas are 5 to 30 acres in size.

Typically, the surface layer is dark grayish brown loamy sand about 8 inches thick. The subsurface layer is loamy sand about 18 inches thick. It is light yellowish brown with grayish brown mottles in the upper part and pale yellow with brownish yellow mottles in the lower part. The subsoil extends to a depth of more than 66 inches. The upper part, to a depth of 29 inches, is light yellowish brown sandy loam with strong brown mottles. The next layer, to a depth of 41 inches, is brownish yellow sandy clay loam that has about 8 percent red plinthite and mottles of yellowish brown and light gray in the lower part. Below that, to a depth of more than 66 inches, is mottled strong brown, yellowish red, light gray, and light red sandy clay loam that is about 18 percent plinthite.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and available water capacity is mainly low. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are small areas of Leefield soils.

This soil has high potential for corn, peanuts, tobacco, soybeans, small grains, hay, and pasture. The seasonal high water table is a slight limitation. A system of ditches or tile drains can be installed to improve drainage. Good tilth is easily maintained by returning crop residue to the soil.

This soil has high potential for slash pine and loblolly pine. It has no significant limitations for woodland use and management.

This soil has medium to high potential for most urban uses, but the seasonal high water table is a severe limitation to the use of this soil for septic tank absorption fields. This limitation can be overcome by installing a drainage system that adequately lowers the water table. The function of the absorption fields can be improved by installing tile lines at a minimum depth and adding about 10 to 15 inches of sandy or loamy soil on the surface.

The soil is in capability subclass IIw and woodland suitability group 3s.

TfA—Tifton loamy sand, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on broad, smooth ridgetops of the Coastal Plain uplands. Individual areas are 10 to 60 acres in size.

Typically, the surface layer is dark grayish brown loamy sand about 9 inches thick. The subsoil extends to a depth of more than 62 inches and is mainly sandy clay loam. It is yellowish brown in the upper part and mottled yellowish brown, yellowish red, red, and light gray in the lower part. The lower part of the subsoil is about 5 to 20 percent plinthite. Nodules of ironstone are in the surface layer and in the upper part of the subsoil.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. This soil has good tilth and can be worked

throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Dothan and Fuquay soils.

This soil has high potential for tobacco, peanuts, corn, soybeans, small grain, hay, and pasture. Good tilth is easily maintained by returning crop residue to the soil. The soil can be cultivated yearly if organic-matter content is maintained.

This soil has high potential for slash pine and loblolly pine. It has no limitations for woodland use or management.

This soil has high potential for most urban uses, but the slow percolation rate in the subsoil is a moderate limitation to the use of this soil for septic tank absorption fields. This limitation can generally be overcome by increasing the size of the absorption area or by modifying the filter field itself.

This soil is in capability class I and woodland suitability group 2o.

TfB—Tifton loamy sand, 2 to 5 percent slopes. This deep, well drained, very gently sloping soil is on broad ridges of the Coastal Plain uplands. Slopes are smooth and convex. Individual areas are 20 to 80 acres in size.

Typically, the surface layer is very dark grayish brown loamy sand about 10 inches thick (fig. 8). The subsoil extends to a depth of more than 63 inches thick. It is brownish yellow sandy loam to a depth of 15 inches. The next layer, to a depth of 59 inches, is yellowish brown sandy clay loam with strong brown, red, and dark red mottles. The lower 6 inches of this layer is mottled yellowish brown, strong brown, red, and light gray sandy clay loam. The lower part of the subsoil is about 5 to 20 percent plinthite. Nodules of ironstone are in the surface layer and the upper part of the subsoil.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Dothan and Fuquay soils. Also included are soils in eroded areas that are similar to this Tifton soil but have a sandy loam surface layer less than 8 inches thick.

This soil has high potential for tobacco, peanuts, corn, soybeans, small grains, hay, and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if cultivated crops are grown. Minimum tillage and the use of cover crops—including grasses and legumes—in the cropping system help to reduce runoff and control erosion.

This soil has high potential for slash pine and loblolly pine. It has no limitations for woodland use and management.

This soil has high potential for most urban uses. A slow percolation rate in the subsoil is a moderate limitation to the use of this soil for septic tank absorption fields. This limitation can generally be overcome by increasing the size of the absorption area or by modifying the filter field itself.

This soil is in capability subclass IIe and woodland suitability group 2o.

TsC2—Tifton sandy loam, 5 to 8 percent slopes, eroded. This deep, well drained, gently sloping soil is on short, convex slopes of the Coastal Plain uplands. The original surface layer has been thinned by erosion, and there are patches where the yellowish brown sandy clay loam subsoil is exposed. A few shallow and deep gullies have formed in some areas. Individual areas are 5 to 20 acres in size.

Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil extends to a depth of more than 75 inches and is mainly sandy clay loam. It is strong brown to a depth of 12 inches. The next layer, to a depth of 31 inches, is yellowish brown. Below this, to a depth of 65 inches, it is brownish yellow with red and light gray mottles. The lower 17 inches of this layer is mottled brownish yellow, light gray, and red. The lower part of the subsoil is about 10 to 25 percent plinthite. Nodules of ironstone are in the surface layer and the upper part of the subsoil.

This soil is low in natural fertility and in organic-matter content. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Carnegie, Cowarts, and Fuquay soils. Also included are a few small areas of soils that are similar to this Tifton soil but have a loamy sand surface layer about 7 inches thick.

This soil has medium potential for corn, soybeans, small grain, hay, and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if cultivated crops are grown. Minimum tillage, terracing, and the use of cover crops—including grasses and legumes—in the cropping system help to reduce runoff and control erosion.

This soil has high potential for slash pine and loblolly pine. It has no limitations for woodland use and management.

This soil has high potential for most urban uses. Slope is a moderate limitation to the use of this soil for small commercial buildings. The slow percolation rate is a moderate limitation for septic tank absorption fields. This

limitation can generally be overcome by increasing the size of the absorption area or by modifying the filter field itself.

This soil is in capability subclass IIIe and woodland suitability group 2o.

WA—Wahee Association. This association is mainly made up of deep, nearly level, somewhat poorly drained soils on flood plains. The soils are on broad stream terraces and are subject to flooding one or more times each year. The duration of the floods is approximately 7 days a month. Within the stream terraces are old stream channels and long, narrow lakes. The soils in this association formed in sediment of clayey old alluvium that washed from the Coastal Plain uplands and the Piedmont Plateau.

Wahee soils make up about 70 percent of the association. Typically, the surface layer is dark grayish brown loam about 3 inches thick. The subsoil extends to a depth of about 54 inches. It is yellowish brown to a depth of 13 inches. The upper part of this layer is sandy clay loam, and the lower part is clay with gray mottles. Below this, to a depth of 36 inches, is gray clay with yellowish brown mottles. The next layer, to a depth of 54 inches, is gray sandy clay loam with yellowish brown mottles. The underlying material is mottled gray, light yellowish brown, and yellowish brown, stratified loamy sand and sandy clay loam.

The Wahee soils have slow permeability. Available water capacity is medium. Natural fertility and organic-matter content are low. The soils are strongly acid or very strongly acid throughout. Tilth is fair. The root zone is limited by the seasonal high water table and the clayey subsoil.

Included with this association in mapping are narrow, lower lying areas of poorly drained clayey soils that are 5 to 10 acres in size. Also included are moderately well drained sandy soils on the remnants of old stream channels. Areas of included soils make up about 30 percent of the map unit.

This association is in woodland that is mainly made up of hardwood trees. A few large areas have been cleared and are planted to pines.

This association has high potential for woodland. Loblolly pine, slash pine, water oak, maple, sycamore, and sweetgum are better suited than other trees. The use of equipment is restricted by long periods of wetness and floods.

This association has very low potential for urban uses. Floods are a limitation to the use of the soils for all urban uses.

This association is in capability subclass IVw and woodland suitability group 2w.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops, pasture, and woodland; as sites for buildings, highways and other transportation systems, sanitary facilities, parks and other recreation facilities; and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the crops or pasture plants best suited to the soil, including some not commonly grown in the survey area, are discussed; the system of land capability classi-

fication used by the Soil Conservation Service is explained; and the predicted yields of the main crops and hay and pasture plants are presented for each soil.

This section provides information about the overall agricultural potential of the survey area and about the management practices that are needed. The information is useful to equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, and others. For each kind of soil, information about management is presented in the section "Soil maps for detailed planning." Planners of management systems for individual fields or farms, should also consider the detailed information given in the description of each soil.

More than 176,900 acres in the survey area were used for crops and pasture in 1967, according to the Conservation Needs Inventory, April 1970. Of this total, 22,600 acres was used for permanent pasture; 117,424 acres for row crops, mainly corn, peanuts, and soybeans; and 6,821 acres for close-growing crops, mainly oats and rye. Total tillage rotation was 151,037 acres; the rest was rotation hay and pasture, hayland, conservation land use only, temporarily idle land, pecan orchards, vineyards and fruit, and open land formerly cropped.

The soils in Candler, Evans, and Tattnall Counties have good potential for increased production of food. About 90,644 acres of potentially good cropland is currently used as woodland, and about 15,284 acres is used as pasture. In addition to the reserve productive capacity represented by this land, food production could also be increased considerably by extending the lastest crop production technology to all cropland in the survey area. This soil survey can help facilitate the application of such technology.

The acreage of urban land has been increasing in recent years. Most of the urban land is on good farmland. The use of this soil survey to help make land use decisions that will influence the future role of farming in the county is discussed in the section "General soil maps for broad land use planning."

Soil erosion is the major concern on about two-thirds of the cropland and pasture in the survey area. If slope is more than 2 percent, erosion is a hazard. Carnegie, Cowarts, Dothan, and Tifton soils, for example, have slopes of 2 to 6 percent, and erosion is the main hazard.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Erosion also reduces productivity on soils that tend to be droughty, such as Bonifay and Fuquay soils. Second, soil erosion on farmland results in sedimentation of streams. The control of erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps a vegetative cover on the soil for extended periods can hold soil erosion losses to amounts that do not limit the productive capacity of the soils. On livestock farms, which require pasture and hay, the legume and grass forage crops in the cropping system reduce erosion on sloping soils and also provide nitrogen and improve tilth for the following crop.

Minimizing tillage and leaving crop residue on the surface help to increase infiltration and to reduce the hazards of runoff and erosion. These practices can be adapted to most soils in the survey area, but they are more difficult to use sucessfully on the eroded soils. No tillage for corn, which is increasing in acreage, is effective in reducing erosion on sloping soils and can be adapted to most soils in the survey area.

Terraces and diversions reduce the length of slope and thereby reduce runoff and erosion (fig. 9). They are not practical on deep, well drained soils that have smooth slopes. Tifton, Dothan, Carnegie, Cowarts, and Fuquay soils are examples of soils that are suitable for terraces.

Contouring and, to some extent, stripcropping are widespread erosion control practices in the survey area (fig. 10). These practices are best adapted to soils that have smooth, uniform slopes, including most areas of Tifton, Dothan, Carnegie, and Fuquay soils.

Soil blowing is a hazard on the sandy Bonifay soils. It can damage these soils and the young crops growing on them in a few hours if the winds are strong and the soils are dry and nearly bare of vegetation or surface mulch. Vegetative cover or surface mulch minimizes the hazard of soil blowing. Windbreaks of pine trees are effective in reducing the hazard of soil blowing in broad, open fields.

Soil drainage is the major management need on about one-fourth of the acreage used for crops and pasture in the survey area (fig. 11). Some soils are naturally so wet that the production of crops common to the area is not possible or feasible. These are the poorly drained or very poorly drained Ellabelle, Hydraquents, Osier, Pelham, and Rutlege soils, which make up about 194,170 acres of the survey area. Most of this acreage is now woodland.

Unless drained, the somewhat poorly drained soils are so wet that crops are damaged during most years. In this category are the Leefield and Wahee soils, which make up about 45,133 acres.

The design of both surface and subsurface drainage systems varies with the kind of soil. A combination of surface drainage and tile drainage is needed in most areas of the poorly drained and very poorly drained soils used for intensive row cropping. Tile drainage is very slow in Bladen and Wahee soils. Finding adequate outlets for tile drainage systems is difficult in areas of Ellabelle, Osier, Pelham, and Rutlege soils.

Soil fertility is naturally low in most soils on uplands in the survey area. All of the soils are naturally acid. The soils in low areas and drainageways and on flood plains,

such as Ellabelle, Osier, Pelham, and Rutlege soils are slightly higher in content of organic matter and in some plant nutrients than most soils on uplands.

Many soils on uplands are naturally very strongly acid. If these soils have never been limed, they require an application of ground limestone to raise the pH level sufficiently for good growth of alfalfa and other similar crops. Available phosphorus and potash are naturally low in most of these soils. On all the soils, additions of lime and fertilizer should be based on the results of soil tests, on the need of the crop, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

Soil tilth is an important factor in the germination of seeds and in the infiltration of water into the soil. Soils with good tilth are granular and porous.

Most of the soils used for crops in the survey area have a surface layer of loamy sand that is low in content of organic matter. Soil tilth is generally good except on the eroded Carnegie and Tifton soils that have an exposed subsoil. Regular additions of crop residue, manure, and other organic material help to improve or maintain soil tilth.

Fall plowing is generally not a good practice. Most of the cropland is on sloping soils that are subject to damaging erosion if they are plowed in the fall.

Special crops that are grown commercially are mostly vegetable crops. A sizable acreage of onions and tomatoes is grown. Turnips, mustard, cabbage, collards, okra, sweet corn, snap beans, butter beans, peppers, and squash are commercially grown, but the total acreage is small. Watermelons and canteloupe are grown on some farms. A moderate acreage is in pecans.

Deep soils that have good natural drainage and that warm up early in spring are especially well suited to many vegetables. In this survey area are the deep Tifton, Dothan, and Cowarts soils that have slopes of less than 6 percent, and they make up about 124,900 acres. Also, if irrigated, about 88,000 acres of Fuquay and Bonifay soils that have slopes of less than 6 percent are very well suited to vegetables and small fruits. Crops can generally be planted and harvested earlier on all of these soils than on the other soils in the survey area.

Most of the well drained soils in the survey area are suitable for orchards and nursery plants. Soils in low positions where frost is more frequent and air drainage is poor generally are poorly suited to early vegetables, small fruits, and orchards.

Latest information and suggestions for growing special crops can be obtained from local offices of the Cooperaive Extension Service and the Soil Conservation Service.

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Absence of an estimated yield indicates that the crop is not suited to or not commonly grown on the soil or that a given crop is not commonly irrigated.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 5.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork. Accurate fertilizer recommendations for a particular soil and a particular crop can be accomplished by soil testing or tissue testing. In the absence of a soil test or tissue test, general fertilizer recommendations are available in Circular 639, revised March 1976, "Fertilizer Recommendations for Field Crops" by P. J. Bergeaux, Extension Agronomist, Soils and Fertilizers, University of Georgia College of Agriculture.

The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management concerns and productivity of the soils for these crops.

Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment (*7*). The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to horticultural crops or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forest trees or for engineering purposes.

In the capability system, all kinds of soil are grouped at three levels: capability class, subclass, and unit. These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class; they are designated by adding a small letter, *e, w, s,* or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is indicated in table 6. All soils in the survey area are included. Some of the soils that are well suited to crops and pasture may be in low-intensity use, for example, soils in capability classes I and II. Data in this table can be used to determine the farming potential of such soils.

The capability subclass is identified in the description of each map unit in the section "Soil maps for detailed planning."

Woodland management and productivity

W.P. Thompson, forester, Soil Conservation Service, assisted in preparing this section.

Virgin forest, mostly longleaf pine, originally covered 98 percent of the land in Candler, Evans, and Tattnall Counties. At present, approximately 67 percent of the total land area is in commercial forest.

Good stands of trees are growing in the woodland areas of these counties. Needleleaved species such as slash, loblolly, and longleaf pines, together with mixed upland broadleaved species, grow on the ridges and side slopes. Broadleaved species consisting of yellow-poplar, American sycamore, sweetgum, and water oak grow along bottom lands.

The value of the wood products is substantial, but production is below potential. Other woodland values include wildlife, recreation, and natural beauty and factors contributing to the conservation of soil and water. This section has been provided to explain how soils affect tree growth and management in these counties.

Table 7 contains information useful to woodland owners or forest managers planning use of soils for wood crops. Map unit symbols for soils suitable for wood crops are listed, and the ordination (woodland suitability) symbol for each soil is given. All soils bearing the same ordination symbol require the same general kinds of woodland management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep

slopes. The letter *o* indicates insignificant limitations or restrictions. If a soil has more than one limitation, priority in placing the soil into a limitation class is in the following order: x, w, t, d, c, s, f, and r.

The third element in the symbol, a numeral, indicates the kind of trees for which the soils in the group are best suited and also indicates the severity of the hazard or limitation. The numerals 1, 2, and 3 indicate slight, moderate, and severe limitations, respectively, and suitability for needleleaf trees. The numerals 4, 5, and 6 indicate slight, moderate, and severe limitations, respectively, and suitability for broadleaf trees. The numerals 7, 8, and 9 indicate slight, moderate, and severe limitations, respectively, and suitability for both needleleaf and broadleaf trees.

In table 7 the soils are also rated for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of major soil limitations.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if some measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or equipment; *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree that the soil affects expected mortality of planted tree seedlings. Plant competition is not considered in the ratings. Seedlings from good planting stock that are properly planted during a period of sufficient rainfall are rated. A rating of *slight* indicates that the mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

The *potential productivity* of merchantable or *important trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years—30 years for cottonwood, 35 years for sycamore, and 50 years for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Important trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suitable for commercial wood production and that are suited to the soils.

Engineering

Walker G. Carter, area engineer, Soil Conservation Service, helped to prepare this section.

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers and ranchers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational uses; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations

can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 8 shows, for each kind of soil, the degree and kind of limitations for building site development; table 9, for sanitary facilities; and table 11, for water management. Table 10 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have a special meaning in soil science. Many of these terms are defined in the Glossary.

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 8. A *slight* limitation indicates that soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 8 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious hazard.

Local roads and streets referred to in table 8 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 9 shows the degree and kind of limitations of each soil for such uses and for use of the soil as

daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good*, *fair*, or *poor*, which, respectively, mean about the same as the terms *slight*, *moderate*, and *severe*.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness can be a limitation, because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. A suitable soil is deep to bedrock and free of large stones and boulders. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 9 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 10 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials.

Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 14 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low potential frost action, and few cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor*.

Sand and *gravel* are used in great quantities in many kinds of construction. The ratings in table 10 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 14.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are free of stones and cobbles, are low in content of gravel, and have gentle slopes. They are low in soluble salts that can limit or prevent plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated *fair* are loose sandy soils or firm loamy or clayey soils in which the suitable material is only 8 to 16 inches thick or soils that have appreciable amounts of gravel, stones, or soluble salt.

Soils rated *poor* are very sandy soils and very firm clayey soils; soils with suitable layers less than 8 inches thick; soils having large amounts of gravel, stones, or soluble salt; steep soils; and poorly drained soils.

Although a rating of *good* is not based entirely on high content of organic matter, a surface horizon is generally preferred for topsoil because of its organic-matter content. This horizon is designated as A1 or Ap in the soil series descriptions. The absorption and retention of moisture and nutrients for plant growth are greatly increased by organic matter.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 11 the degree of soil limitation and soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Soil and site limitations are expressed as slight, moderate, and severe. *Slight* means that the soil properties and site features are generally favorable for the specified use and that any limitation is minor and easily overcome. *Moderate* means that some soil properties or site features are unfavorable for the specified use but can be overcome or modified by special planning and design. *Severe* means that the soil properties and site features are so unfavorable and so difficult to correct or overcome that major soil reclamation, special design, or intensive maintenance is required.

Pond reservoir areas hold water behind a dam or embankment (fig. 12). Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organ-

ic matter in a soil downgrade the suitability of a soil for use in embankments, dikes, and levees.

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; salinity and alkalinity; and availability of outlets for drainage.

Irrigation is affected by such features as slope, susceptibility to flooding, hazards of water erosion and soil blowing, texture, presence of salts and alkali, depth of root zone, rate of water intake at the surface, permeability of the soil below the surface layer, available water capacity, need for drainage, and depth to the water table.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to intercept runoff. They allow water to soak into the soil or flow slowly to an outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock, hardpan, or other unfavorable material; large stones; permeability; ease of establishing vegetation; and resistance to water erosion, soil blowing, soil slipping, and piping.

Grassed waterways are constructed to channel runoff to outlets at a nonerosive velocity (fig. 13). Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

Recreation

James Dean and Robert Kitchens, district conservationists, Soil Conservation Service, assisted in preparing this section.

The major recreational facilities in the survey area are within or near the larger towns. Gordonia Alatamaha Park is near Reidsville and covers 225 acres. It has a fishing lake, a swimming pool, camp areas, sheltered picnic areas, and playgrounds. The Georgia Game and Fish Department manages a pond near Daisy that covers 100 acres. This pond is open to the public for fishing.

Several public landings are located along the rivers in the survey area. Most of these landings have facilities for boat launching, camping, and picnicking. Fishing is available in about 1,300 farm ponds and in lakes, creeks, and rivers. Bobwhite quail, dove, deer, fox, and rabbit are numerous in the survey area.

The soils of the survey area are rated in table 12 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 12 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 9, and interpretations for dwellings without basements and for local roads and streets, given in table 8.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the

annual period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

Wildlife habitat

Jesse Mercer, Jr., biologist, Soil Conservation Service, assisted in preparing this section.

The survey area provides habitat for a variety of wildlife species. Deer, fox, raccoon, and squirrel and many songbirds and nongame animals are common in woodland. Quail, rabbit, and dove are abundant near cropland. Habitat for fish consists of many acres in the Canoochee River and in farm ponds. About 700 acres of beaver ponds, which are especially attractive to wood ducks, is in the survey area.

Wildlife is a valuable resource in Candler, Evans, and Tattnall Counties. About 52 percent of the soils have fair to good potential for openland wildlife habitat, and about 77 percent have fair to good potential for woodland wildlife habitat. About 46 percent of the soils have fair to good potential for wetland wildlife habitat.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 13, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of wildlife are very severe, and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

The elements of wildlife habitat are briefly described in the following paragraphs.

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are bahiagrass, rye, ryegrass, clover, annual lespedeza, perennial lespedeza, oats, millet, cowpeas, and soybeans.

Wild herbaceous plants are native or naturally established grasses, legumes, and forbs, including weeds, that provide food and cover for wildlife. Major soil properties that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are ragweed, croton, perennial lespedeza, partridgepea, beggarweed, pokeweed, shrub lespedeza, and cheatgrass.

Hardwood trees and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of native plants are beech, oak, poplar, cherry, sweetgum, hawthorn, dogwood, persimmon, maple, sassafras, sumac, honeysuckle, elgeagnus, hickory, blackberry. Examples of fruit-producing shrubs that are commercially available and suitable for planting on soils rated *good* are autumn-olive and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Soil properties that have a major effect on the growth of coniferous plants are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or

cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, and cordgrass and rushes, sedges, and reeds.

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kinds of wildlife attracted to these areas include bobwhite quail, dove, meadowlark, field sparrow, killdeer, cottontail, deer, and red fox.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, oppossum, woodcock, thrushes, woodpecker, squirrel, gray fox, raccoon, and deer.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. Some of the wildlife attracted to such areas are duck, geese, heron, snipe, muskrat, mink, raccoon, wild hog, and beaver.

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.

In making soil borings during field mapping, soil scientists can identify several important soil properties. They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consistence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH or reaction of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area. They also present data about pertinent soil and water features, engineering test data, and data obtained from physical and chemical laboratory analyses of soils.

Engineering properties

Table 14 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 14 gives information for each of these contrasting horizons in a typical profile. *Depth* to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon is given for each soil series in the section "Soil series and morphology."

Texture is described in table 14 in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loam." Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (Unified) (*3*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*2*).

The *Unified* system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested in the survey area, with group index numbers in parentheses, is given in table 17. The estimated classification, without group index numbers, is given in table 14. Also in table 14 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Percentage of the soil material less than 3 inches in diameter that passes each of four sieves (U.S. standard) is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified and AASHTO soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and plasticity index are estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made during the survey.

In some surveys, the estimates are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount across classification boundaries (1 or 2 percent), the classification in the marginal zone is omitted.

Physical and chemical properties

Table 15 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Risk of corrosion pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rate of corrosion of concrete is based mainly on the sulfate content, texture, and acidity of the soil. Protective measures for steel or more resistant concrete help to avoid or minimize damage resulting from the corrosion. Uncoated steel intersecting soil boundaries or soil horizons is more susceptible to corrosion than an installation that is entirely within one kind of soil or within one soil horizon.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility

factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 16 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods after rains or after snowmelts is not considered flooding, nor is water in swamps and marshes. Flooding is rated in general terms that describe the frequency and duration of flooding and the time of year when flooding is most likely. The ratings are based on evidence in the soil profile of the effects of flooding, namely thin strata of gravel, sand, silt, or, in places, clay deposited by floodwater; irregular decrease in organic-matter content with increasing depth; and absence of distinctive soil horizons that form in soils of the area that are not subject to flooding. The ratings are also based on local information about floodwater levels in the area and the extent of flooding; and on information that relates the position of each soil on the landscape to historic floods.

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific, however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between grayish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. Only saturated zones above a depth of 5 or 6 feet are indicated.

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not construction of basements is feasible and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Depth to bedrock is shown for all soils that are underlain by bedrock at a depth of 5 to 6 feet or less. For many soils, the limited depth to bedrock is a part of the definition of the soil series. The depths shown are based on measurements made in many soil borings and on other observations during the mapping of the soils. The kind of bedrock and its hardness as related to ease of excavation is also shown. Rippable bedrock can be excavated with a single-tooth ripping attachment on a 200-horsepower tractor, but hard bedrock generally requires blasting.

Engineering test data

The results of analyses of engineering properties of several typical soils of the survey area are given in table 17.

The data presented are for soil samples that were collected from carefully selected sites. The soil profiles sampled are typical of the series discussed in the section "Soil series and morphology." The soil samples were analyzed by the Georgia Department of Transportation.

The methods used in obtaining the data are listed by code in the next paragraph. Most of the codes, in parentheses, refer to the methods assigned by the American Association of State Highway and Transportation Officials. The code for Unified classification is that assigned by the American Society for Testing and Materials.

The methods and codes are AASHTO classification (M-145-66); Unified classification (D-2487-66T); mechanical analysis (T88-57); liquid limit (T89-60); plasticity index (T90-56); moisture-density, method A (T99-57); volume change (ABER) (*1*).

Soil series and morphology

In this section, each soil series recognized in the survey area is described in detail. The descriptions are arranged in alphabetic order by series name.

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the Soil Survey Manual (*6*). Unless otherwise noted, colors described are for moist soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or mapping units, of each soil series are described in the section "Soil maps for detailed planning."

Albany series

The Albany series consists of deep, somewhat poorly drained, moderately permeable soils that formed in sandy and loamy marine sediment. These soils are nearly level and are on smooth landscapes of the Coastal Plain. A seasonal high water table is within 12 to 30 inches of the surface late in winter and early in spring. Slopes range from 0 to 2 percent.

Albany soils are associated with the Pelham, Rutlege, and Bonifay soils. Pelham soils are in a slightly lower position in the landscape, are poorly drained, and have a thinner A horizon. Rutlege soils are in depressions, very poorly drained, and have a thicker, dark colored A horizon. Bonifay soils are on adjacent ridges and are well drained.

Typical pedon of Albany sand, 0 to 2 percent slopes, in a cultivated field, 0.7 mile north of Canoochee River along Georgia Highway 129, 0.7 mile northwest along dirt road, 0.3 mile west along field road, and 50 feet south; in Candler County:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) sand; weak fine granular structure; loose, very friable; many very fine roots; strongly acid; abrupt smooth boundary.

A21—7 to 12 inches; pale brown (10YR 6/3) sand; few fine distinct dark grayish brown mottles; weak fine granular structure; loose, very friable; few very fine roots; very strongly acid; clear wavy boundary.

A22—12 to 19 inches; light yellowish brown (2.5Y 6/4) sand; few fine distinct strong brown (7.5YR 5/6) mottles; weak fine granular structure; loose, very friable; very strongly acid; gradual wavy boundary.

A23—19 to 47 inches; light yellowish brown (2.5YR 6/4) sand; common medium faint light brownish gray (10YR 6/2) mottles; common medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak medium granular structure; loose, very friable; about 1 percent plinthite; few very fine roots; very strongly acid; gradual wavy boundary.

B1—47 to 54 inches; brownish yellow (10YR 6/6) sandy loam; many medium strong brown (7.5YR 5/6) mottles; common, medium distinct light brownish gray (10YR 6/2) and common medium prominent yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; soft, very friable; nonsticky; common areas of stripped sand grains; about 3 percent plinthite; very strongly acid; gradual wavy boundary.

B2t—54 to 72 inches; brownish yellow (10YR 6/6) and light gray (10YR 6/1) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; very strongly acid.

The solum ranges from 60 inches to more than 72 inches in thickness. The soil is strongly acid or very strongly acid except where limed.

The A horizon ranges from 42 to 52 inches in thickness. The Ap or A1 horizon has hue of 10YR, value of 4, and chroma of 1 or 2. The A2 horizon has hue of 2.5Y and 10YR, value of 6 or 7, and chroma of 3 or 4. It has few to common mottles of gray, brown, or yellow.

The B1 horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 6. Common to many gray, brown, red, or yellow mottles are throughout the B1 horizon.

The B2t horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 6. It is sandy clay loam or sandy loam. Mottles have hue of 10YR and 2.5Y, value of 5 to 7, and chroma of 1 to 6. In some pedons the lower part does not have a matrix color and is mottled in gray, brown, and white.

Bladen series

The Bladen series consists of deep, poorly drained soils that formed in thick, clayey sediment on fluvial and marine terraces. These soils are on low, broad landscapes. They are saturated with water late in winter and early in spring, and the lower areas flood during periods of high rainfall. Permeability is slow. Slopes range from 0 to 2 percent.

Bladen soils are associated with the Craven, Ellabelle, and Pelham soils. Craven soils are in a higher position on the landscape and are better drained. Ellabelle soils have a thicker, dark colored A1 horizon and are more poorly drained. Pelham soils have a sandy A horizon more than 20 inches thick.

Typical pedon of Bladen fine sandy loam, in a wooded area, 1.2 miles north of Bluff Lake and 1.0 mile west of county road; in Tattnall County:

A1—0 to 4 inches; dark gray (10YR 4/1) fine sandy loam; weak fine granular structure; soft, very friable, nonsticky; many fine roots; very strongly acid; clear smooth boundary.

A2—4 to 8 inches; light brownish gray (10YR 6/2) fine sandy loam; weak medium granular structure; soft, very friable, nonsticky; common fine roots; very strongly acid; clear smooth boundary.

B22tg—8 to 22 inches; gray (10YR 5/1) clay; common medium distinct brownish yellow (10YR 6/8) and yellowish red (5YR 4/6) mottles; moderate medium angular blocky structure; very hard, very firm; very plastic; continuous clay films on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

B23tg—22 to 64 inches; light gray (10YR 7/1) sandy clay; common medium distinct brownish yellow (10YR 6/8) and olive yellow (2.5Y 6/6) mottles; moderate medium subangular blocky structure; very hard, very firm; plastic; patchy clay films on faces of peds; very strongly acid.

The solum ranges from 60 to more than 64 inches in thickness. The soil is strongly acid or very strongly acid except where limed.

The A horizon ranges from 8 or 9 inches in thickness. The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The Btg horizon has hue of 10YR or 5Y, value of 5 or 6, and chroma of 1 or 2. It is sandy clay or clay. Thin lenses, tongues, and pockets of sandy loam or sandy clay loam are common in some pedons. Few to common, fine or medium yellow, brown, and red mottles are throughout the horizon.

Bonifay series

The Bonifay series consists of deep, well drained soils that formed in marine deposits of sandy and loamy material. These soils are on narrow to broad ridges. Permeability is moderate. Slopes are mainly less than 6 percent but range to as much as 12 percent.

Bonifay soils are associated with the Albany, Fuquay, and Kershaw soils. Albany soils have mottles with chroma of 2 or less in the A horizon and in the upper part of the Bt horizon. Fuquay soils have a sandy A horizon that is less than 40 inches thick. Kershaw soils do not have a Bt horizon and are sandy to a depth of 80 inches or more.

Typical pedon of Bonifay fine sand, 1 to 8 percent slopes, in a wooded area, 3.5 miles north of Georgia Highway 46 in Metter along Georgia Highway 23, 1.7 miles north along paved county road, and 25 feet east of road; in Candler County:

A1—0 to 5 inches; gray (10YR 5/1) fine sand; weak fine granular structure; loose, very friable; many very fine and few medium roots; very strongly acid; clear smooth boundary.

A21—5 to 15 inches; light yellowish brown (10YR 6/4) fine sand; few fine yellowish brown mottles; weak fine granular structure; loose, very friable; few bodies of uncoated sand grains; common and few fine and few medium roots; common very fine pieces of charcoal; very strongly acid; gradual wavy boundary.

A22—15 to 36 inches; very pale brown (10YR 7/4) fine sand; common fine faint yellowish brown mottles; weak fine granular structure; loose, very friable; 10 percent uncoated sand grains; common fine and few medium roots; few very fine pieces of charcoal; very strongly acid; gradual wavy boundary.

A23—36 to 54 inches; very pale brown (10YR 7/3) fine sand; few fine distinct brownish yellow mottles; single grain; loose, very friable; 15 percent uncoated sand grains; few medium roots; few nodules of ironstone; very strongly acid; gradual smooth boundary.

A24—54 to 57 inches; brownish yellow (10YR 6/6) fine sand; single grain; loose, very friable; few nodules of ironstone; very strongly acid; clear smooth boundary.

B1—57 to 61 inches; brownish yellow (10YR 6/8) sandy loam; weak medium granular structure; soft, very friable; slightly sticky; few very fine roots; few medium nodules of ironstone; very strongly acid; clear smooth boundary.

B21t—61 to 70 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; 3 percent plinthite; few medium nodules of ironstone; very strongly acid; gradual wavy boundary.

B22t—70 to 80 inches; brownish yellow (10YR 6/8) sandy clay loam; common medium distinct light gray (10YR 7/1) mottles and common medium prominent yellowish red (5YR 5/8) and red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; 8 percent plinthite; very strongly acid.

The solum ranges from 72 to more than 110 inches in thickness. The soil is strongly acid or very strongly acid except where it is limed.

The A horizon ranges from 43 to 77 inches in thickness. The A1 horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3. The A2 horizon has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 3 to 6.

The Bt horizon has hue of 10YR, value of 5 to 8, and chroma of 6 to 8. Common to many red, brown, and gray mottles are below a depth of 62 to 82 inches. The content of plinthite is more than 5 percent at a depth of 61 to 75 inches.

This soil is classified as a taxadjunct to the Bonifay series because the depth to plinthite is more than 60 inches for most pedons.

Carnegie series

The Carnegie series consists of deep, well drained soils that formed in thick, loamy marine sediment. These soils are on undulating Coastal Plain uplands. Permeability is moderate in the upper part of the solum and moderately slow in the lower part. Slopes range from 5 to 12 percent.

Carnegie soils are associated with the Cowarts, Dothan, and Tifton soils. Cowarts soils have less than 5 percent nodules of ironstone. Dothan and Tifton soils have more than 5 percent plinthite at a depth of more than 24 inches.

Typical pedon of Carnegie sandy loam, 5 to 8 percent slopes, eroded, in a cultivated field, 1 mile northeast of U.S. Highway 301 along Georgia Highway 250, and 50 feet east of highway; in Tattnall County:

Apcn—0 to 6 inches; brown (10YR 5/3) sandy loam; weak fine granular structure; loose, very friable, nonsticky; 20 percent nodules of ironstone; many very fine roots; strongly acid; abrupt smooth boundary.

B21tcn—6 to 14 inches; strong brown (7.5YR 5/8) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; common very fine roots; 15 percent nodules of ironstone; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22t—14 to 18 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium faint strong brown (7.5YR 5/8) and few medium prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; common patchy clay films on faces of peds; 2 percent plinthite; few nodules of ironstone; very strongly acid; gradual wavy boundary.

B23t—18 to 27 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium distinct yellowish red (5YR 5/8), common medium prominent dark red (10R 3/6), and few fine distinct light gray mottles; moderate medium angular blocky structure; hard, firm, sticky; continuous clay films on faces of peds; about 3 percent plinthite; few nodules of ironstone; very strongly acid; gradual wavy boundary.

B24t—27 to 37 inches; mottled yellowish brown (10YR 5/8), red (10R 4/8), dark red (10R 3/6), and light gray (10YR 7/2) sandy clay loam; moderate medium subangular blocky structure; hard, firm, sticky; common patchy clay films on faces of peds; 4 percent plinthite; very strongly acid; gradual wavy boundary.

B3—37 to 65 inches; mottled yellowish brown (10YR 5/6), brownish yellow (10YR 6/6), red (10R 4/8), and light gray (10YR 7/1) sandy clay loam; moderate coarse subangular blocky structure; hard, firm, sticky; 2 percent plinthite; few patchy clay films on faces of peds; very strongly acid.

The solum ranges from 50 to more than 70 inches in thickness. The soil is strongly acid or very strongly acid throughout except where it is limed. Ironstone nodules in the A horizon and in the upper part of the Bt horizon range from 2 to 25 percent.

The Ap or A1 horizon ranges from 4 to 8 inches in thickness. It has hue of 10YR, value of 3 to 5, and chroma of 2 to 3. The A2 horizon, where present, is 2 to 4 inches thick. It has hue of 10YR, value of 5, and chroma of 3 to 6.

The Bt horizon has hue of 10YR and 7.5YR, value of 5 or 6, and chroma of 6 to 8. Common to many red, yellow, and gray mottles are below a depth of 11 to 24 inches. The mottled layers are mostly firm, but they are friable in some pedons. The content of plinthite in these layers ranges from 2 to 4 percent.

Cowarts series

The Cowarts series consists of deep, well drained soils that formed in thick, loamy marine sediment. These soils are on irregular Coastal Plain uplands. They are moderately permeable in the upper part of the solum and slowly permeable in the lower part. Slopes range from 2 to 8 percent.

Cowarts soils are associated with the Carnegie, Tifton, and Dothan soils. Carnegie and Tifton soils have more than 5 percent nodules of ironstone in the A horizon and upper part of the B horizon. Dothan and Tifton soils have more than 5 percent plinthite at a depth of more than 24 inches.

Typical pedon of Cowarts loamy sand, 5 to 8 percent slopes, in a cultivated field, 0.6 mile south of paved crossroads in Cobbtown along Georgia Highway 121, 1.3 miles west along county road, and 25 yards west of road; in Tattnall County:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; loose, very friable; very strongly acid; abrupt smooth boundary.

A2—7 to 11 inches; light yellowish brown (10YR 6/4) loamy sand; few fine faint yellow and few fine distinct dark gray mottles; weak medium granular struc-

ture; loose, very friable; very strongly acid; clear wavy boundary.

B1—11 to 17 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; very strongly acid; gradual wavy boundary.

B21t—17 to 34 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium prominent red (2.5YR 4/8) mottles; few fine distinct light gray mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; 5 percent slightly brittle plinthite; few clay films on faces of peds; few quartz pebbles; very strongly acid; gradual wavy boundary.

B22t—34 to 56 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium prominent red (2.5YR 4/8) and yellowish red (5YR 5/8) mottles and few medium distinct light gray (10YR 7/1) mottles; moderate medium subangular blocky structure; hard, firm, sticky; 5 percent brittle plinthite; few clay films on faces of peds; few quartz pebbles; very strongly acid; gradual wavy boundary.

B23t—56 to 70 inches; reticulately mottled light gray (10YR 7/1) and red (2.5YR 4/8) sandy clay; brownish yellow (10YR 6/8) mottles around red mottles; moderate medium subangular blocky structure; hard, firm, sticky; common clay films on faces of peds; very strongly acid.

The solum ranges from 60 to more than 87 inches in thickness. The soil is strongly acid or very strongly acid throughout except where limed. The percentage of ironstone nodules in the A horizon and the upper part of the Bt horizon ranges from 0 to 4 percent. Depth to horizons with more than 5 percent plinthite is 17 to 24 inches.

The A1 or Ap horizon has hue of 10YR or 2.5Y, value of 4 or 6, and chroma of 2 or 3. The A2 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 or 4.

The B21t and B22t horizons have hue of 10YR and 7.5YR, value of 5 or 6, and chroma of 6 to 8. The B23t horizon is reticulately mottled and has hue of 10YR to 10R, value of 3 to 8, and chroma of 1 to 8. It is firm or very firm sandy clay loam or sandy clay. The content of plinthite ranges from 5 to 10 percent in the B21t and B22t horizons and from 0 to 5 percent in the B23t horizon.

Craven series

The Craven series consists of deep, moderately well drained, slowly permeable soils that formed in clayey sediment on fluvial and marine terraces. These nearly level soils are on broad, smooth landscapes. A seasonal high water table is generally within 24 to 36 inches of the surface from December through March. Permeability is slow. Slopes range from 0 to 1 percent.

Craven soils are associated with the Bladen and Pelham soils. Bladen and Pelham soils are in a lower position on the landscape and are poorly drained. Pelham soils have a thicker A horizon that is sandy.

Typical pedon of Craven fine sandy loam, 0 to 1 percent slopes, in a wooded area, 0.3 mile north of Tippins Lake along dirt road and 200 feet east of road; in Tattnall County:

A1—0 to 5 inches; gray (10YR 5/1) fine sandy loam; weak fine granular structure; soft, very friable; common fine and very fine roots; very strongly acid; clear smooth boundary.

A2—5 to 8 inches; pale brown (10YR 6/3) fine sandy loam; common fine faint grayish brown mottles; weak fine granular structure; soft, very friable; common fine worm castings; common fine roots; very strongly acid; clear wavy boundary.

B1—8 to 11 inches; yellowish brown (10YR 5/6) sandy clay loam; weak fine subangular blocky structure; slightly hard, friable, slightly sticky; common fine and medium roots; common very fine pores; very strongly acid; clear wavy boundary.

B21t—11 to 14 inches; strong brown (7.5YR 5/6) sandy clay; moderate medium subangular blocky structure; hard, friable, plastic; few patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22t—14 to 18 inches; strong brown (7.5YR 5/6) clay; few fine prominent red mottles; moderate fine subangular blocky structure; hard, firm, plastic; few clay films on faces of peds; very strongly acid; gradual wavy boundary.

B23t—18 to 38 inches; strong brown (7.5YR 5/6) clay; common medium distinct red (2.5YR 4/6) and light gray (10YR 6/1) mottles; moderate medium angular blocky structure; hard, firm, plastic; many clay films on faces of peds; very strongly acid; gradual wavy boundary.

B24t—38 to 46 inches; mottled strong brown (7.5YR 5/6), light gray (10YR 6/1), and red (2.5YR 4/8) sandy clay; moderate medium subangular blocky structure; hard, friable, plastic; common clay films on faces of peds; very strongly acid; gradual wavy boundary.

Cg—46 to 68 inches; light gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) and common medium prominent red (10YR 4/8) mottles; massive breaking to weak medium subangular blocky structure; slightly hard, friable, slightly sticky; very strongly acid.

The solum ranges from 40 to 58 inches in thickness. The soil is strongly acid or very strongly acid except where it is limed.

The A horizon is 5 to 14 inches thick. The A1 or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. The A2 horizon, where present, has hue of 10YR or 2.5Y, value of 5 to 6, and chroma of 2 to 4.

The Bt horizon has hue of 10YR and 7.5YR, value of 4 to 6, and chroma of 4 to 8. Few to many gray, brown, and red mottles are below a depth of 17 to 20 inches. The clay content in the upper 20 inches of the Bt horizon ranges from 3 to 55 percent.

The C horizon ranges from sandy clay loam to coarse sand.

This soil is classified as a taxadjunct to the Craven series because the silt content is slightly higher than is characteristic of the series.

Dothan series

The Dothan series consists of deep, well drained soils that formed in thick loamy marine sediment. These nearly level to gently sloping soils are on broad Coastal Plain uplands. Permeability is moderately slow. Slopes range from 0 to 5 percent.

Dothan soils are associated with the Carnegie, Cowarts, Fuquay, and Tifton soils. Carnegie and Cowarts soils have 4 percent or more plinthite at a shallower depth, generally less than 24 inches. Fuquay soils have an A horizon that is more than 20 inches thick. Tifton soils have more than 5 percent nodules of ironstone in the A horizon and in the upper part of the B horizon.

Typical pedon of Dothan loamy sand, 2 to 5 percent slopes, in a cultivated field, 1.5 miles east of Number One Sams Creek along Stilmore-Metter road, 0.6 mile north along dirt road, and 300 yards west in field, in Candler County:

Ap—0 to 7 inches; grayish brown (10YR 5/2) loamy sand; weak fine granular structure; loose, very friable; few nodules of ironstone; common very fine pores; strongly acid; abrupt smooth boundary.

A2—7 to 10 inches; light yellowish brown (10YR 6/4) loamy sand; weak fine granular structure; loose, very friable; few very fine roots; common very fine pores; strongly acid; clear wavy boundary.

B1—10 to 13 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; soft, very friable; few very fine roots; common very fine pores; very strongly acid; gradual smooth boundary.

B21t—13 to 38 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; few patchy clay films on faces of peds; few very fine pores; few nodules of plinthite in the lower part; very strongly acid; gradual wavy boundary.

B22t—38 to 45 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent yellowish red (5YR 5/8) and red (2.5YR 4/6) mottles and common fine light gray mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; compact in places; common patchy clay films on faces of peds; about 15 percent plinthite; very strongly acid; gradual wavy boundary.

B23t—45 to 70 inches; mottled brownish yellow (10YR 6/8), dark reddish brown (5YR 3/4), light gray (10YR 7/2), and light red (10R 6/8) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; few patchy clay films on faces of peds; about 5 percent plinthite; very strongly acid.

The solum ranges from 60 to more than 74 inches in thickness. The soil is strongly acid or very strongly acid throughout except where it is limed. The percentage of ironstone nodules ranges from none to 5 percent in the A horizon and upper part of the B horizon.

The A horizon ranges from 10 to 18 inches in thickness. The A1 or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. The A2 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 6 to 8. Common to many gray, brown, and red mottles and about 5 to 20 percent plinthite are below a depth of 30 to 50 inches. Texture ranges from sandy clay loam to sandy clay in the lower part.

Ellabelle series

The Ellabelle series consists of deep, very poorly drained soils that formed in thick beds of loamy marine and fluvial deposits. These soils are in slight depressions of the Coastal Plain. They are frequently flooded for very long periods, mainly late in winter and early in spring. Slopes are less than 2 percent.

Ellabelle soils are associated with the Albany and Pelham soils. Albany soils are in a higher lying position on the landscape, are better drained, and have an A horizon that is more than 40 inches thick. Pelham soils do not have an umbric epipedon and are slightly better drained. They are in the same position on the landscape.

Typical pedon of Ellabelle loamy sand, in a wooded area, 1 mile south of Tattnall-Evans County line along Georgia Highway 169, and 3 miles east along Union Camp private road; in Tattnall County:

O1—1 inch to 0; dark gray (10YR 4/1) partly decomposed leaves and straw.

A11—0 to 6 inches; black (10YR 2/1) loamy sand; weak fine granular structure; loose, very friable; many fine roots; very strongly acid; clear smooth boundary.

A12—6 to 27 inches; black (10YR 2/1) loamy sand; common medium distinct light gray (10YR 7/1) mottles; weak medium granular structure; loose, very friable; very strongly acid; clear wavy boundary.

A2—27 to 37 inches; light brownish gray (10YR 6/2) loamy sand; common medium distinct light gray (10YR 7/1) mottles; weak medium granular struc-

ture; loose, very friable; few fine pores; very strongly acid; gradual wavy boundary.

B21tg—37 to 50 inches; gray (N 5/0) sandy clay loam; common fine distinct strong brown mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; common medium stratas and pockets of loamy sand; common fine pores; very strongly acid; gradual wavy boundary.

B22tg—50 to 65 inches; gray (10YR 5/1) sandy clay loam; many coarse distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; hard, friable, sticky; patchy clay films on faces of peds; very strongly acid.

The solum ranges from 60 to more than 65 inches in thickness. The soil is very strongly acid or strongly acid except where it is limed.

The A horizon ranges from 25 to 37 inches in thickness. The A1 horizon is 23 to 30 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 1; or it is neutral and has value of 2.

The A2 horizon is 26 to more than 33 inches thick. It has hue of 2.5Y or 10YR, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 5.

The Btg horizon is 26 to more than 33 inches thick. It has hue of 2.5Y or 10YR, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 5. Common or many, fine to coarse yellowish and brownish mottles are throughout the horizon.

Fuquay series

The Fuquay series consists of deep, well drained soils that formed in thick, loamy marine deposits. These soils are on broad ridges of the Coastal Plain uplands. Permeability is moderate in the upper part of the subsoil and is slow in the lower part. Slopes range from 1 to 8 percent.

Fuquay soils are associated with the Cowarts, Dothan, and Tifton soils. Cowarts soils have 5 percent or more plinthite at a shallower depth and generally are in steeper positions on the landscape. Dothan and Tifton soils have an A horizon that is less than 20 inches thick and they are in the same position on the landscape. Tifton soils have 5 percent or more ironstone nodules in the A horizon and in the upper part of the B horizon, and they do not have an arenic horizon.

Typical pedon of Fuquay loamy sand, 1 to 5 percent slopes, in a cultivated field, 1.2 miles southeast of Seaboard Railroad in Hagan, Georgia, along paved county road, 0.2 mile west along dirt road, and 25 feet north; in Evans County:

Ap—0 to 11 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; loose, very friable; common very fine roots; very strongly acid; abrupt smooth boundary.

A21—11 to 20 inches; light yellowish brown (10YR 6/4) loamy sand; few medium distinct grayish brown (10YR 5/2) mottles; weak fine granular structure; very friable, loose; few very fine and fine roots; very strongly acid; gradual wavy boundary.

A22—20 to 28 inches; brownish yellow (10YR 6/6) loamy sand; weak medium granular structure; loose, very friable; few very fine roots; very strongly acid; gradual wavy boundary.

B1—28 to 33 inches; brownish yellow (10YR 6/8) sandy loam; weak medium subangular blocky structure; soft, very friable; few fine and medium roots; very strongly acid; gradual wavy boundary.

B21t—33 to 46 inches; brownish yellow (10YR 6/6) sandy clay loam; moderate medium subangular blocky structure; sand grains coated and bridged with clay; slightly hard, friable, slightly sticky; about 2 percent plinthite; few nodules of ironstone; few medium roots; very strongly acid; clear wavy boundary.

B22t—46 to 56 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium prominent yellowish red (5YR 5/8) and strong brown (7.5YR 5/8) and few medium prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; about 8 percent plinthite; few patchy clay films on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

B23t—56 to 68 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct light gray (10YR 7/2) and common medium prominent yellowish red (5YR 5/8) and red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; slightly hard, friable except firm in and around plinthite, slightly sticky; 12 to 15 percent plinthite; few nodules of ironstone; very strongly acid.

The solum ranges from 80 to more than 90 inches in thickness. The soil is strongly acid or very strongly acid except where it is limed. The content of ironstone nodules ranges from 0 to 5 percent in the A and B horizons. The content of plinthite is more than 5 percent at a depth of 45 to 53 inches.

The A horizon ranges from 22 to 37 inches in thickness. The A1 or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. The A2 horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6.

The B21t and B22t horizons have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 6 to 8. The B22t horizon has few to many red, yellowish brown, strong brown, and gray mottles. The B23t horizon has the same color range as the B21t and B22t horizons and has common to many red, brown, yellow, and gray mottles, or it is mottled red, brown, yellow, and gray.

Hydraquents

Hydraquents consists of deep, very poorly drained, fluvial sediment in depressions on the Altamaha River flood plain. Slopes are less than 1 percent. Permeability is slow. Floodwater reaches a height of 6 feet during rainy periods, mainly late in winter and early in spring.

Hydraquents are associated with the Wahee soils. Wahee soils are better drained and are in higher terrace positions on the landscape.

Pedons of Hydraquents mapped on the flood plain of the Altamaha River are variable; therefore, they are classified at the subgroup level. A reference pedon of Hydraquents in a wooded swamp, 1 mile north of the Altamaha River along Georgia Highway 121, and 150 yards west of highway; in Tattnall County:

A1—0 to 8 inches; dark brown (10YR 4/3) silt loam and organic matter; massive; slightly sticky, soft, slightly hard; when squeezed in hand, soil flows between the fingers freely (N value 1.0); many fine and medium roots; very strongly acid; gradual wavy boundary.

C1g—8 to 28 inches; gray (10YR 5/1) silty clay loam; massive; slightly sticky, friable, hard; when squeezed in hand soil flows between fingers with difficulty (N value 0.7); many very fine to medium roots; very strongly acid; gradual wavy boundary.

C2g—28 to 60 inches; gray (10YR 6/1) silty clay; massive; sticky, friable, very hard; when squeezed in hand soil flows between fingers with difficulty (N value 0.7); many fine and very fine roots; very strongly acid.

Irvington series

The Irvington series consists of deep, moderately well drained soils that formed in thick loamy marine sediment. These nearly level soils are on smooth Coastal Plain uplands. They are seasonally wet and are saturated in winter and early in spring. Slopes are mainly 0 to 1 percent but range to as much as 2 percent in places that are mainly adjacent to better drained soil.

Irvington soils are associated with the Tifton, Stilson, and Leefield soils. Tifton soils are better drained and do not have a fragipan in the B horizon. Stilson and Leefield soils have a sandy A horizon that is more than 20 inches thick.

Typical pedon of Irvington loamy sand, 0 to 2 percent slopes, in a wooded area, 1.1 miles south of Evans County line along Georgia Highway 169, and 200 feet west; in Tattnall County:

Ap—0 to 8 inches; gray (10YR 5/1) loamy sand; weak fine granular structure; loose, very friable; many fine and very fine roots; very strongly acid; abrupt smooth boundary.

A2—8 to 14 inches; light yellowish brown (2.5Y 6/4) loamy sand; few medium distinct grayish brown (10YR 5/2) and few fine distinct strong brown mottles; weak fine granular structure; loose; very friable; few fine roots and pores; few nodules of ironstone; very strongly acid; clear smooth boundary.

B1—14 to 21 inches; light yellowish brown (2.5Y 6/4) sandy loam; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky; estimated 4 percent nodules of ironstone; common fine pores; few fine roots; very strongly acid; gradual wavy boundary.

B21cn—21 to 30 inches; light yellowish brown (2.5Y 6/4) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; estimated 20 percent nodules of ironstone; few fine pores; very strongly acid; clear smooth boundary.

B22cn—30 to 34 inches; light yellowish brown (2.5YR 6/4) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; few medium prominent yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; estimated 6 percent nodules of ironstone; few fine pores; very strongly acid; clear smooth boundary.

Bx—34 to 64 inches; mottled yellowish brown (10YR 5/8), yellowish red (5YR 4/8), light gray (10YR 6/1), and red (10YR 4/6) sandy clay loam; moderate medium subangular blocky structure; slightly sticky, firm, and brittle in more than 65 percent of the volume; very hard; estimated 15 percent plinthite; few patchy clay films on faces of peds; few fine pores; very strongly acid.

The solum ranges from 60 to more than 80 inches in thickness. The soil is strongly acid or very strongly acid except where it is limed. Depth to horizons that are more than 5 percent plinthite is 22 to 34 inches.

The A horizon ranges from 13 to 18 inches in thickness. The A1 or Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. The A2 horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 4.

The B2t horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 4 to 8. Common to many gray, brown, and red mottles are below a depth of 22 to 30 inches.

The Bx horizon ranges from 30 to more than 40 inches thick. It mainly has yellowish, grayish, brownish, and reddish mottles. The content of plinthite ranges from 15 to 30 percent, and the content of ironstone nodules ranges from few to 30 percent.

This soil is classified as a taxadjunct to the Irvington series because the A horizon is coarser textured and slightly thicker than allowed in the series.

Kershaw series

The Kershaw series consists of deep, excessively drained, sandy soils that formed in thick marine and eolian deposits of sand. These soils are on fairly smooth uplands and dunelike landscapes of the Coastal Plain. Slopes range from 2 to 8 percent.

Kershaw soils are associated with the Kureb and Bonifay soils. Kureb soils have a leached A2 horizon and a spodic horizon. Bonifay soils have a loamy argillic horizon between depths of 40 to 60 inches.

Typical pedon of Kershaw sand, 2 to 8 percent slopes, in a wooded area, 0.2 mile west of Saul's pond on Stillmore Road, and 100 feet north of road; in Candler County.

A1—0 to 3 inches; dark gray (10YR 4/1) sand; single grain; loose, very friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.
C1—3 to 12 inches; yellow (10YR 7/6) sand; few fine faint white mottles; single grain; loose, very friable; common fine and medium roots; very strongly acid; gradual wavy boundary.
C2—12 to 40 inches; brownish yellow (10YR 6/6) sand; single grain; loose, very friable; few fine roots; very strongly acid; gradual wavy boundary.
C3—40 to 83 inches; yellow (10YR 7/6) sand; single grain; loose, very friable; very strongly acid.

These soils are very strongly acid except where they are limed. The 10 to 40-inch control section contains less than 5 percent silt and clay. Texture is sand or coarse sand to a depth of more than 88 inches.

The A horizon ranges from 2 to 4 inches in thickness. It has hue of 10YR, value of 4 or 5, and chroma of 1 or 2.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 6. Few to common mottles of white or yellowish brown are below a depth of 69 inches in some pedons.

Kureb series

The Kureb series consists of deep, excessively drained, sandy soils that formed in thick marine and eolian deposits of sand. These soils are on side slopes of ridges along streams and edges of bays of the Coastal Plain uplands. Slopes range from 5 to 12 percent.

The Kureb soils are associated with the Kershaw and Bonifay soils. Kershaw soils do not have a leached A2 horizon and a spodic horizon. Bonifay soils have a Bt horizon within 60 inches of the surface.

Typical pedon of Kureb sand, 5 to 12 percent slopes, in a wooded area, 0.3 mile west of Little Flock Church along county road, and 0.3 mile south of road; in Tattnall County:

O1—1 inch to 0; decaying leaves and twigs; matted fine and very fine roots.
A1—0 to 4 inches; very dark gray (10YR 3/1) sand; weak fine granular structure; loose, very friable; sand grains have salt and pepper appearance; many fine and very fine roots; very strongly acid; clear smooth boundary.
A2—4 to 38 inches; white (10YR 8/1) sand; single grain; loose, very friable; few fine roots; very strongly acid; gradual irregular boundary.
C&Bh—38 to 46 inches; yellowish brown (10YR 5/6) sand; common medium distinct dark brown (7.5YR 4/4) and brown (10YR 5/3) mottles; single grain; loose, very friable; brownish mottles are organic stains; many clean sand grains; very strongly acid; gradual wavy boundary.
C1—46 to 70 inches; light yellowish brown (10YR 6/4) sand; single grain; loose, very friable; very strongly acid; gradual wavy boundary.
C2—70 to 80 inches; very pale brown (10YR 7/4) sand; common medium faint brownish yellow (10YR 6/6) mottles; single grain; loose, very friable; very strongly acid.

The sandy horizons are more than 80 inches thick, and texture ranges from sand to coarse sand. Silt and clay is less than 5 percent. The soil is strongly acid to very strongly acid except where it is limed. Depth to the C and Bh horizon ranges from 13 to 42 inches.

The A1 horizon is 3 to 5 inches thick. It has hue of 10YR, value of 3 to 6, and chroma of 1 or 2. The A2 horizon is 7 to 37 inches thick. It has hue of 10YR, value of 7 or 8, and chroma of 1 or 2.

The C&Bh horizon is 8 to 31 inches thick. The C part of the C&Bh horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 6. The Bh part of the C&Bh horizon has hue of 7.5YR and 10YR, value of 3 to 5, and chroma of 3 or 4.

The C horizon has hue of 10YR, value of 6 to 8, and chroma of 4 to 6.

Leefield series

The Leefield series consists of deep, somewhat poorly drained soils that formed in thick loamy marine sediment. These nearly level soils are on low uplands of the Coastal Plain. A seasonal high water table is within 18 to 30 inches of the surface late in winter and early in spring. Permeability is moderately slow. Slopes are less than 2 percent.

Leefield soils are associated with the Fuquay, Irvington, Pelham, and Stilson soils. Fuquay soils are better drained and are in a higher position on the landscape. Irvington soils do not have the arenic horizon but have a fragipan in the Bt horizon. They are in the same position on the landscape as Pelham and Stilson soils. Pelham soils are poorly drained and do not have plinthite in the

Bt horizon. Stilson soils are better drained and do not have gray mottles within 30 inches of the surface.

Typical pedon of Leefield loamy sand, in a cultivated field, 0.4 mile south of TERC Day School along paved road, and 100 yards west; in Tattnall County:

Ap—0 to 12 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; loose, very friable; many very fine roots; very strongly acid; abrupt smooth boundary.

A2—12 to 26 inches; pale yellow (2.5Y 7/4) loamy sand; common fine faint brownish yellow mottles; weak fine granular structure; loose, very friable; few very fine roots; common medium bodies of stripped sand grains; very strongly acid; clear wavy boundary.

B1—26 to 30 inches; light yellowish brown (2.5Y 6/4) sandy loam; common medium distinct yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; soft, very friable; common fine pores; very strongly acid; gradual wavy boundary.

B21t—30 to 46 inches; light yellowish brown (2.5Y 6/4) sandy clay loam; many medium distinct yellowish brown (10YR 5/8) and light gray (10YR 7/2) mottles and common coarse prominent strong brown (7.5YR 5/6) and red (2.5YR 5/6) mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; estimated 4 percent plinthite; few fine pores; very strongly acid; gradual wavy boundary.

B22t—46 to 57 inches; mottled pale yellow (2.5Y 7/4), yellowish brown (10YR 5/8), light gray (10YR 7/2), and yellowish red (5YR 4/8) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; few patchy clay films on faces of peds; estimated 8 percent plinthite; few medium pockets of loamy sand; few fine pores; very strongly acid; gradual wavy boundary.

B23t—57 to 66 inches; mottled light gray (10YR 7/1), strong brown (7.5YR 5/6), red (2.5YR 4/8), and brownish yellow (10YR 6/6) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; brittle in areas of the very coarse plinthite; few patchy clay films on faces of peds; estimated 15 percent plinthite; common medium bodies of stripped sand grains; common fine pores; very strongly acid.

The solum ranges from 60 to more than 95 inches in thickness. The soil is strongly acid or very strongly acid throughout except where it is limed. Depth to horizons that are more than 5 percent plinthite is 30 to 46 inches.

The A horizon ranges from 21 to 32 inches in thickness. The A1 or Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 or 2. The A2 horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 6.

The B1 horizon has hue of 10YR or 2.5Y, value of 6 to 7, and chroma of 3 to 6. Few to common brownish, yellowish, or gray mottles are throughout the horizon.

The B21t horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 4 to 8 and has common to many gray, brown, or red mottles. The B22t and B23t horizons have red, brown, yellow, and gray mottles, or they have hue of 10YR to 2.5Y, value of 6 to 8, and chroma of 0 to 8.

Osier series

The Osier series consists of deep, poorly drained soils that formed in recent sandy alluvium. These nearly level soils are on narrow to broad flood plains of small to large streams of the Coastal Plain. They are commonly flooded for brief periods of 2 to 7 days, mainly from December to April. During periods between floods, the water table is within about 12 inches of the surface. Permeability is rapid. Slopes are less than 2 percent.

Osier soils are associated with the Albany, Leefield, and Pelham soils. Albany soils are in higher positions on the landscape and are better drained. Leefield soils are better drained, have an argillic horizon within 40 inches of the surface, and contain plinthite. Pelham soils have an argillic horizon within 40 inches of the surface.

Typical pedon of Osier loamy fine sand from an area of mapped Osier soils, in a wooded area, 0.5 mile south of Georgia Highway 46 in Pulaski, Georgia, along paved county road, 0.5 mile southwest along dirt road, 0.7 mile south along dirt road, and 0.3 mile southwest along electric powerline right-of-way; in Candler County:

A11—0 to 6 inches; dark gray (10YR 4/1) loamy fine sand; weak fine granular structure; loose, very friable; many fine and medium roots; very strongly acid; gradual smooth boundary.

A12—6 to 12 inches; gray (10YR 5/1) loamy sand; common medium faint gray (10YR 6/1) mottles; weak fine granular structure; loose, very friable; common fine and medium roots; very strongly acid; gradual wavy boundary.

C1g—12 to 40 inches; gray (10YR 5/1) sand; single grain; loose, very friable; few medium roots; very strongly acid; gradual wavy boundary.

C2g—40 to 62 inches; light gray (10YR 7/1) sand; single grain; loose, very friable; very strongly acid.

The soil is strongly acid or very strongly acid throughout. The A horizon ranges from 3 to 15 inches in thickness. It has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is fine sandy loam, loamy fine sand, loamy sand, or sand.

The C horizon is more than 30 inches thick. It has hue of 10YR, value of 3 to 7, and chroma of 1 or 2. It is loamy sand, sand, or coarse sand. In places, few to

common fine or medium yellow or brown mottles are throughout the horizon.

Pelham series

The Pelham series consists of deep, poorly drained soils that formed in thick, loamy marine sediment. These soils are on broad, wet flats and in depressions and small drainageways of the Coastal Plain. A seasonal high water table is within 6 to 18 inches of the surface late in winter and early in spring. Permeability is moderate. Slopes are less than 2 percent.

Pelham soils are associated with the Ellabelle, Leefield, and Osier soils. Ellabelle soils are very poorly drained and have an umbric epipedon. Leefield soils are better drained and have more than 5 percent plinthite in the Bt horizon. Osier soils are alluvial and mainly sandy to a depth of more than 40 inches.

Typical pedon of Pelham loamy sand, in a wooded area, 0.5 mile south of Evans County line, 0.5 mile west along Pine Ridge Road, and 50 feet north of road; in Tattnall County:

A1—0 to 7 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; loose, very friable; many fine and very fine roots; very strongly acid; clear wavy boundary.

A21—7 to 17 inches; light brownish gray (10YR 6/2) loamy sand; many medium distinct gray (10YR 5/1) mottles; weak fine granular structure; loose, very friable; common fine roots; very strongly acid; gradual wavy boundary.

A22—17 to 32 inches; gray (10YR 6/1) loamy sand; common medium distinct light yellowish brown (10YR 6/4) and grayish brown (10YR 5/2) mottles; weak, fine granular structure; loose, very friable; very strongly acid; gradual irregular boundary.

B2tg—32 to 72 inches; gray (10YR 6/1) sandy clay loam; many coarse distinct brownish yellow (10YR 6/6) and yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; slightly hard; friable, slightly sticky; pockets of loamy sand in an estimated 20 percent of horizon; common fine pores; very strongly acid.

The solum ranges from 60 to more than 90 inches in thickness. The soil is strongly acid or very strongly acid throughout except where it is limed.

The A horizon ranges from 21 to 38 inches in thickness. The A1 or Ap horizon has hue of 10YR, 2.5Y, or 5Y; value of 2 to 4; and chroma of 1. The A2 horizon has hue of 10YR, 2.5Y, and 5Y; value of 4 to 7; and chroma of 1 or 2.

The Bt horizon is sandy loam or sandy clay loam. Mottles range from few to many in shades of red, yellow, and brown. This horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 to 7, and chroma of 0 or 2. In many pedons this horizon has pockets or bodies of sand or loamy sand, 2 to 6 inches in diameter.

Rutlege series

The Rutlege series consists of deep, very poorly drained soils that formed in thick, sandy marine sediment. These soils are in bays and depressions of the Coastal Plain. Permeability is rapid. Slopes are less than 2 percent.

Rutlege soils are mainly associated with the Albany soils and, to a lesser extent, are near Kershaw and Osier soils. Kershaw soils are in a higher position on the landscape and are better drained. Pelham and Osier soils are in the same position on the landscape but do not have an umbric epipedon.

Typical pedon of Rutlege sand, in a wooded area, 2.2 miles east of the Ohoopee River along Georgia Highway 152, and 200 yards south of highway; in Tattnall County:

O1—3 inches to 0, dark reddish brown (5YR 3/2) organic matter; many fine and medium roots.

A11—0 to 12 inches; very dark gray (10YR 3/1) sand; common medium faint black (10YR 2/1) mottles; weak medium granular structure; loose, very friable; many fine roots; about 10 percent organic matter; very strongly acid; gradual wavy boundary.

A12—12 to 20 inches; very dark gray (10YR 3/1) sand; single grain; loose, very friable; few medium roots; very strongly acid; gradual wavy boundary.

A13—20 to 38 inches; very dark grayish brown (10YR 3/2) sand; single grain; loose, very friable; very strongly acid; gradual wavy boundary.

Cg—38 to 70 inches; light brownish gray (10YR 6/2) sand; single grain; loose, very friable; very strongly acid.

Silt and clay in the control section is 5 to 12 percent. The soil is very strongly acid or extremely acid throughout the profile.

The A horizon is 15 to more than 40 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 0 to 2. The Cg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2.

This soil is classified as a taxadjunct to the Rutlege series because the umbric horizon is thicker than allowed for the series.

Stilson series

The Stilson series consists of deep, moderately well drained soils that formed in thick, loamy marine sediment. These soils are nearly level and are on low uplands of the Coastal Plain. A seasonal high water table is within 2.5 to 3 feet of the surface late in winter and early in spring. Permeability is moderate. Slopes are less than 2 percent.

Stilson soils are associated with the Fuquay, Irvington, and Leefield soils. Fuquay soils are better drained and do not have gray mottles within 40 inches of the surface. They are at higher elevations. Irvington soils have a fragipan in the B horizon, and Leefield soils are not as well drained and have gray mottles within 30 inches of the surface. Both soils are in the same position on the landscape.

Typical pedon of Stilson loamy sand, in a wooded area, 2.8 miles south of the Evans County line along Georgia Highway 169, and 200 yards west of highway; in Tattnall County:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; soft, very friable; many fine roots; very strongly acid; abrupt wavy boundary.

A21—8 to 15 inches; light yellowish brown (2.5Y 6/4) loamy sand; common medium distinct grayish brown (10YR 5/2) mottles; weak fine granular structure; soft, very friable; few fine roots; very strongly acid; gradual wavy boundary.

A22—15 to 26 inches; pale yellow (2.5Y 7/4) loamy sand; common fine distinct, brownish yellow mottles; weak fine granular structure; loose, very friable; common fine roots; clear wavy boundary.

B1—26 to 29 inches; light yellowish brown (2.5Y 6/4) sandy loam; common fine distinct strong brown mottles; weak medium subangular blocky structure; slightly hard, very friable; common fine roots; few fine bodies of clean sand grains; very strongly acid; gradual wavy boundary.

B21t—29 to 35 inches; brownish yellow (10YR 6/6) sandy clay loam; few fine distinct very pale brown mottles; moderate, medium subangular blocky structure; slightly hard, friable, slightly sticky; sand grains coated and bridged with clay; few fine roots; very strongly acid; gradual wavy boundary.

B22t—35 to 41 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct yellowish brown (10YR 5/8), light gray (10YR 7/2), and yellowish red (5YR 4/8) mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; few patchy clay films on faces of peds; an estimated 8 percent plinthite; very strongly acid; gradual wavy boundary.

B23t—41 to 66 inches; mottled strong brown (7.5YR 5/8), yellowish red (5YR 4/8), light gray (10YR 7/1), and light red (10R 6/8) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; an estimated 18 percent plinthite; few patchy clay films on faces of peds; common fine pores; very strongly acid.

The solum ranges from 60 to more than 85 inches in thickness. The soil is strongly acid or very strongly acid throughout except where it is limed. Depth to horizons that have more than 5 percent plinthite is 35 to 42 inches.

The Ap or A1 horizon ranges from 7 to 12 inches in thickness. It has hue of 2.5Y or 10YR, value of 3 to 5, and chroma of 1 or 2.

The A2 horizon is 10 to 20 inches thick. It has hue of 2.5Y or 10YR, value of 6 or 7, and chroma of 4 to 6.

The B21t and B22t horizons have hue of 10YR, value of 5 to 8, and chroma of 4 to 8. Common to many yellowish, brownish, gray, and red mottles are below a depth of 33 to 39 inches. The B23t horizon ranges from mottled gray, brown, yellow, and red to a matrix in hue of 10YR to 2.5Y, value of 6 to 8, and chroma of 4 to 8 with common gray, brown, and red mottles.

Tifton series

The Tifton series consists of deep, well drained soils that formed in thick, loamy marine sediment. These soils are on broad Coastal Plain uplands. Permeability is moderate. Slopes range from 0 to 8 percent.

Tifton soils are associated with the Carnegie, Cowarts, Dothan, Irvington, and Fuquay soils. Carnegie and Cowarts soils have plinthite at a shallower depth, Dothan soils have less than 5 percent nodules of ironstone, Irvington soils have a fragipan, and Fuquay soils have an A horizon that is sandy to a depth of 20 inches or more.

Typical pedon of Tifton loamy sand, 0 to 2 percent slopes, in a cultivated field, 0.9 mile west of Georgia Highway 23 along Georgia Highway 144, 100 yards south; in Tattnall County:

Apcn—0 to 9 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; loose, very friable; 12 percent nodules of ironstone; common very fine roots; strongly acid; abrupt smooth boundary.

B1cn—9 to 12 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; soft, very friable; 15 percent nodules of ironstone; strongly acid; clear smooth boundary.

B21tcn—12 to 36 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; 15 percent nodules of ironstone; very strongly acid; gradual wavy boundary.

B22t—36 to 48 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent yellowish red (5YR 5/6) and red (2.5YR 5/8) mottles; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky; about 5 percent plinthite; very strongly acid; gradual wavy boundary.

B23t—48 to 62 inches; mottled yellowish brown (10YR 5/8), red (10YR 4/6), yellowish red (5YR 5/6), and light gray (10YR 7/1) sandy clay loam; moderate medium subangular blocky structure; hard, firm, sticky; about 20 percent plinthite; very strongly acid.

The solum ranges from 70 to more than 90 inches in thickness. The soil is strongly acid or very strongly acid except where it is limed. Depth to horizons that are more than 5 percent plinthite is 31 to 50 inches.

The A1 and Ap horizons are sandy loam or loamy sand and range from 5 to 11 inches thick. They have hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Ironstone nodules range from 6 to 20 percent. The A2 horizon, if present, is 3 to 5 inches thick. It has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6. Ironstone nodules range from 10 to 15 percent.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. It is mostly sandy clay loam but ranges to sandy clay in the B23t horizon of some profiles. Below a depth of 31 inches and extending to a depth of 52 inches are common or many yellowish, brownish, gray, and red mottles. The content of plinthite ranges from about 5 to 20 percent.

Wahee series

The Wahee series consists of deep, somewhat poorly drained soils that formed in fluvial deposits. These soils are on terraces of flood plains of the Altamaha River. Permeability is slow. Slopes range from 0 to 2 percent.

Wahee soils are associated with the Typic Hydraquents. Typic Hydraquents are more poorly drained and are at a lower elevation.

Typical pedon of Wahee loam in an area of Wahee association, in a wooded swamp, 0.9 mile east of Toombs County line along the Altamaha River, and 1.3 miles north; in Tattnall County:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; sticky, very friable, slightly hard; many fine and very fine roots; very strongly acid; clear smooth boundary.

B1—3 to 7 inches; yellowish brown (10YR 5/4) sandy clay loam; few fine distinct light brownish gray mottles; moderate medium subangular blocky structure; sticky, friable, slightly hard; many fine and very fine roots; very strongly acid; clear wavy boundary.

B21t—7 to 13 inches; yellowish brown (10YR 5/4) clay; common medium distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; slightly plastic, firm, hard; few clay films on faces of peds; few medium roots; very strongly acid; gradual wavy boundary.

B22tg—13 to 36 inches; gray (10YR 6/1) clay; many coarse distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; sticky, firm, hard; very strongly acid; gradual wavy boundary.

B3g—36 to 54 inches; gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; sticky, friable, slightly hard; very strongly acid; gradual wavy boundary.

C—54 to 65 inches; mottled gray (5Y 6/1), light yellowish brown (10YR 6/4), and yellowish brown (10YR 5/6) loamy sand and few thin strata of sandy clay loam; single grain; loose, very friable; very strongly acid.

The solum ranges from 50 to 60 inches in thickness. The soil is very strongly acid or strongly acid.

The A horizon is 2 to 5 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. It is loam, silt loam, or sandy loam.

The B21t horizon is 3 to 6 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. The B22t has hue of 10YR to 5Y, value of 5 or 6, and chroma of 1 or 2. The Bt horizon is clay or clay loam.

Classification of the soils

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Readers interested in further details about the system should refer to "Soil taxonomy" (*8*).

The system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 18, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the proper-

ties of the soil. An example is Psammaquents (*Psamm*, meaning sandy horizons, plus *aquent*, the suborder of Entisols that have an aquic moisture regime).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. An example is Typic Psammaquents.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is siliceous, thermic Typic Psammaquents.

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

Formation of the soils

Glenn L. Bramlett, soil scientist, Soil Conservation Service, assisted in the preparation of this section.

This section discusses the factors of soil formation, relates them to the formation of soils in the survey area, and explains the processes of soil formation.

Soil is produced when parent material, climate, relief, and plants and animals interact for a period of time (*5*). These factors determine the nature of the soil that is formed. All of these factors affect the formation of each soil, but the relative importance of each factor differs from place to place.

In some areas one factor may be dominant and determine most of the properties of the soil. A common example is a soil that formed in parent material consisting of pure quartz sand. Quartz sand is highly resistant to weathering, and soils formed in it generally have faint horizons. Even in quartz sand, however, a distinct profile can form under certain types of vegetation, if relief is low and flat and the water table is high. The five factors of soil formation are discussed in the following paragraphs.

Parent material

Parent material is the unconsolidated mass in which soil forms. It largely determines the chemical and mineralogical composition of a soil. In Candler, Evans, and Tattnall Counties, the parent material of all soils is sediment that was deposited by water.

In these counties, differences in the parent material are largely the result of the manner in which the sands, silts, and clays were sorted and deposited by the ocean and streams many thousands of years ago. Different kinds of soils have formed because of these differences in sorting and deposition. In most soils, profile development is strong because the parent material has been above water and exposed to the soil-forming forces for a long time.

Six marine terraces are in this survey area (*4*). These terraces, in order from highest to lowest elevation, are the Hawthorn, Brandywine, Coharie, Sunderland, Wicomico, and Penholloway terrace formations. The Hawthorn Formation is of the Miocene Epoch, and the other formations are of the Pleistocene Epoch.

The Hawthorn Formation is in all of Candler County and the areas north of Collins and Claxton. Some smaller areas are near Reidsville and Glennville. The main soils that formed from this formation are the Tifton, Carnegie, Dothan, Cowarts, and Fuquay soils. The Brandywine Formation occupies a small area east of Reidsville and north to Collins. The main soils that formed from this formation are the Fuquay, Leefield, and Pelham soils. The Coharie Formation occupies a triangular area between Reidsville, Claxton, and Glennville. The main soils that formed from this formation are the Irvington, Stilson, Leefield, Pelham, and Osier soils. The Sunderland Formation is in mostly the sandy area on the east side of the Ohoopee River in Tattnall County from Georgia Highway 292 south to Georgia Highway 178. The main soils that formed from this formation are the Kershaw, Bonifay, and Rutlege soils. The Wicomico Formation occupies an area parallel to the flood plains of the Altamaha River. The main soils that formed from this formation are the Pelham, Albany, and Leefield soils.

The Penholloway Formation is in the lowest areas parallel to the Altamaha River above the flood plains. This formation is a strip between the Wicomico Formation and the flood plains. The main soils that formed from the Penholloway Formation are the Pelham, Osier, Ellabelle, Bladen, and Craven soils.

Climate

Climate, particularly temperature and rainfall, largely determines the rate and the nature of the physical, chemical, and biological processes that affect the weath-

ering of soil material. Rainfall, freezing, thawing, wind, and sunlight have much to do with the breakdown of rocks and minerals, the release of chemicals, and other processes that affect the development of soils. The amount of water that percolates through the soil depends on rainfall, relative humidity, soil permeability, and physiographic position. Temperature influences the kinds and growth of organisms and the speed of physical and chemical reactions in the soils.

The warm, humid climate of Candler, Evans, and Tattnall Counties is characterized by long, hot summers, and short, mild winters. The average rainfall is about 50 inches per year. Much of the water from rainfall percolates through the soil and moves dissolved or suspended materials downward so that the soils are generally low in bases. The rainfall is generally well distributed so that the soils are moist most of the year. Because the surface soil is frozen for only short periods, freezing and thawing have little effect on the development of the soils. The climate throughout the survey area is uniform and has had about the same effect on soil development in all parts. As is normal in this climate, most of the soils on uplands in these counties are highly weathered, leached, strongly acid, low in natural fertility, and low in content of organic matter.

Relief

Relief, through its effect on drainage, erosion, plant cover, and temperature, modifies the effect of climate and vegetation on soil formation.

Soils on low flats and in depressions have a high water table and are flooded each year. The soils in these areas are moderately well drained to poorly drained and have a gray or mottled subsoil. Pelham and Ellabelle soils are examples of soils developed in the low areas. Soils on broad ridges have a water table that is several feet below the surface. Soils in these areas are not flooded. The soils commonly are well drained and are mainly red to yellow. Tifton, Dothan, and Fuquay soils are examples of soils that developed in the higher areas.

A level or nearly level surface allows more time for water to penetrate the soil, and more water percolates through it. This influences the solution and translocation of soluble materials. The moisture available in the soil also determines, to a significant extent, the amount and kinds of plants grown. Thus, steep soils that have a slowly permeable surface layer are generally drier than level or nearly level soils, and less vegetation grows on them.

The soils in Candler, Evans, and Tattnall Counties are mostly nearly level to gently sloping, but they range to strongly sloping. The landscape is not extremely hilly, however; and the effect of relief on soil temperature is less pronounced than it is in more hilly and mountainous areas. In these counties, soil temperature is affected more by differences in drainage than by relief.

Plants and animals

Plants, animals, bacteria, and other organisms are active in the soil-forming processes. The changes they bring about depend mainly on the kinds of life processes peculiar to each. The kinds of plants and animals that live on and in the soil are affected, in turn, by climate, parent material, relief, and the age of the soils.

Most of the soils in Candler, Evans, and Tattnall Counties formed under forests of various kinds of hardwoods and pines. These kinds of trees supply most of the organic matter to the soils. The hardwoods contribute more than the softwoods, but the content of organic matter in most of the soils is generally low.

Plants provide a cover that helps to reduce erosion and to stabilize the surface so that the soil-forming processes can continue. Leaves, twigs, roots, and entire plants accumulate on the surface of soils under forest and then decompose as the result of the action of percolating water and of micro-organisms, earthworms, and other forms of life. Also, the uprooting of trees by wind significantly influences the formation of soils by mixing the soil layers and loosening the underlying material.

Small animals, earthworms, insects, and micro-organisms also influence the formation of soils by mixing organic matter into the soil and by helping to break down the remains of plants. Small animals burrow into the soils, and thus, mix the layers. Earthworms and other small invertebrates feed on the organic matter in the upper few inches. They slowly but continually mix the soil material and, in places, alter it chemically. Bacteria, fungi, and other micro-organisms hasten the weathering of rocks and the decomposition of organic matter.

Time

Generally, a long time is required for a soil to form, but the length of time required for the formation of a mature soil depends upon the other soil-forming factors. A mature soil profile is one in which the zones of eluviation (A horizon) and of illuviation (B horizon) are easily recognized. Less time is required for a soil to form in a humid, warm area where the vegetation is abundant than in a dry or cold area where the vegetation is sparse. Generally, less time is required if the parent material is coarse textured than if it is fine textured.

Older soils show a greater degree of horizon differentiation than younger ones. For example, the processes of soil formation have been active on the smoother uplands in the counties for a long time. These soils, therefore, have well-defined horizons. Tifton, Dothan, Carnegie, and Cowarts soils are examples of older soils. Along the streams the soil material has not been in place long enough for well-differentiated horizons to develop. Osier soils are examples of younger soils.

References

(1) Abercrombie, W. F. 1954. A system of soil classification. Highw. Res. Board Proc. Publ. 324, pp. 509-514, illus.

(2) American Association of State Highway [and Transportation] Officials. 1970. Standard specifications for highway materials and methods of sampling and testing. Ed. 10, 2 vol., illus.

(3) American Society for Testing and Materials. 1974. Method for classification of soils for engineering purposes. ASTM Stand. D 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(4) Georgia Division of Mines, Mining and Geology. 1939. Geologic map of Georgia. Ga. Div. Mines, Mining & Geol., in coop. U.S. Dep. Inter., Geol. Surv., 1 p.

(5) United States Department of Agriculture. 1938. Soils and men. U.S. Dep. Agric. Yearb., 1,232 pp., illus.

(6) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus. Supplements replacing pp. 173-188 issued May 1962

(7) United States Department of Agriculture. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210, 21 pp.

(8) United States Department of Agriculture, Soil Conservation Service. 1975. Soil taxonomy: a basic system of soil classification for making and interpreting soil surveys. U.S. Dep. Agric. Handb. 436, 754 pp., illus.

Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	More than 9

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to frequent flooding.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

Coarse textured (light textured) soil. Sand or loamy sand.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water control measures is difficult.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is 40 or 80 inches (1 or 2 meters).

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave. Unstable walls of cuts made by earthmoving equipment. The soil sloughs easily.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation

during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Fast intake. The rapid movement of water into the soil.

Favorable. Favorable soil features for the specified use.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fine textured (heavy textured) soil. Sandy clay, silty clay, and clay.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May*, for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher

bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. A soil having one or more neutral gray horizons as a result of waterlogging and lack of oxygen. The term "gleyed" also designates gray horizons and horizons having yellow and gray mottles as a result of intermittent waterlogging.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Green manure (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Habitat. The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. Inadequate strength for supporting loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is greater than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness

and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material mixed with mineral soil material. The content of organic matter is more than 20 percent.

Munsell notation. A designation of color by degrees of the three single variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Pan. A compact, dense layer in a soil. A pan impedes the movement of water and the growth of roots. The word "pan" is commonly combined with other words that more explicitly indicate the nature of the layer; for example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly. The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water of subsurface tunnels or pipelike cavities in the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents that commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on exposure to repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade, whereas ironstone cannot be cut but can be broken or shattered with a spade. Plinthite is one form of the material that has been called laterite.

Poorly graded. Refers to soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity is measured in terms of output, or harvest, in relation to input.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Rooting depth. Shallow root zone. The soil is shallow over a layer that greatly restricts roots. See Root zone.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface

runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Seepage. The rapid movement of water through the soil. Seepage adversely affects the specified use.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Soil. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use or management.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or " very fine."

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil (engineering). Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Trace elements. The chemical elements in soils, in only extremely small amounts, essential to plant growth. Examples are zinc, cobalt, manganese, copper, and iron.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, artesian. A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to a soil or soil material consisting of particles well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

ILLUSTRATIONS

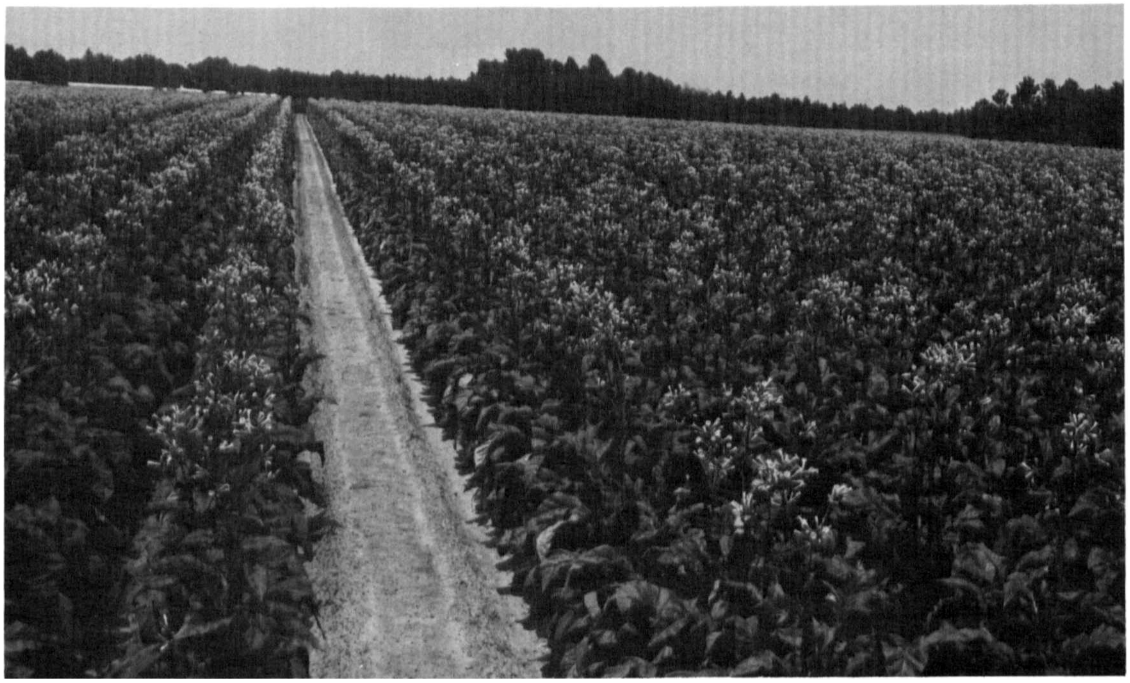


Figure 1.—This tobacco crop is on Tifton loamy sand, 0 to 2 percent slopes.

Figure 2.—Peanuts and soybeans are planted on the contour to reduce runoff and control erosion in this area of Dothan loamy sand, 2 to 5 percent slopes.

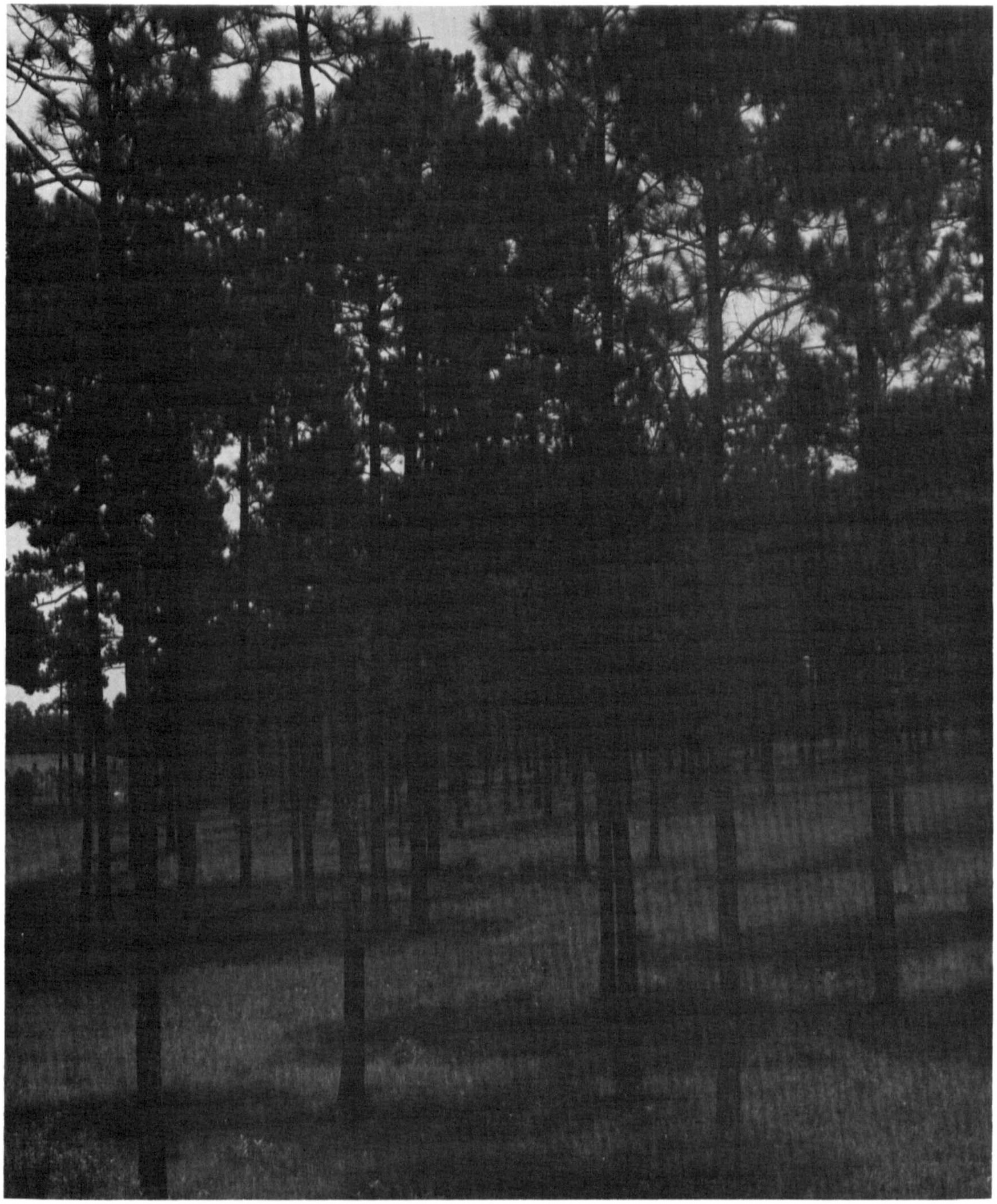


Figure 3.—This properly managed stand of pine trees is on Cowarts loamy sand, 5 to 8 percent slopes.

Figure 4.—Typical woodland vegetation is in this area of the Pelham-Leefield map unit.

Figure 5.—The soils are used for pasture on this typical landscape of the Tifton-Fuquay map unit.

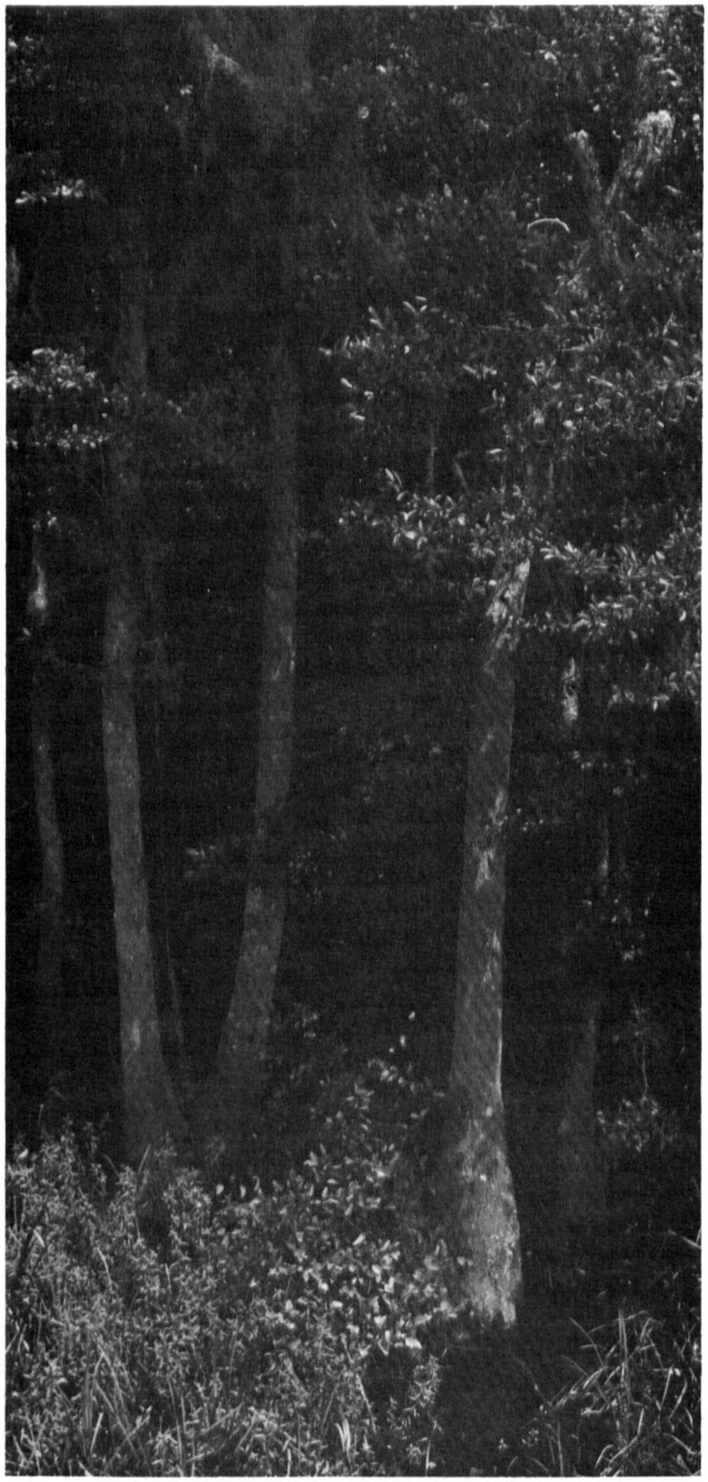


Figure 6.—Typical vegetation on the Osier-Pelham map unit consists of black gum, bay, cypress, and water-tolerant grasses.

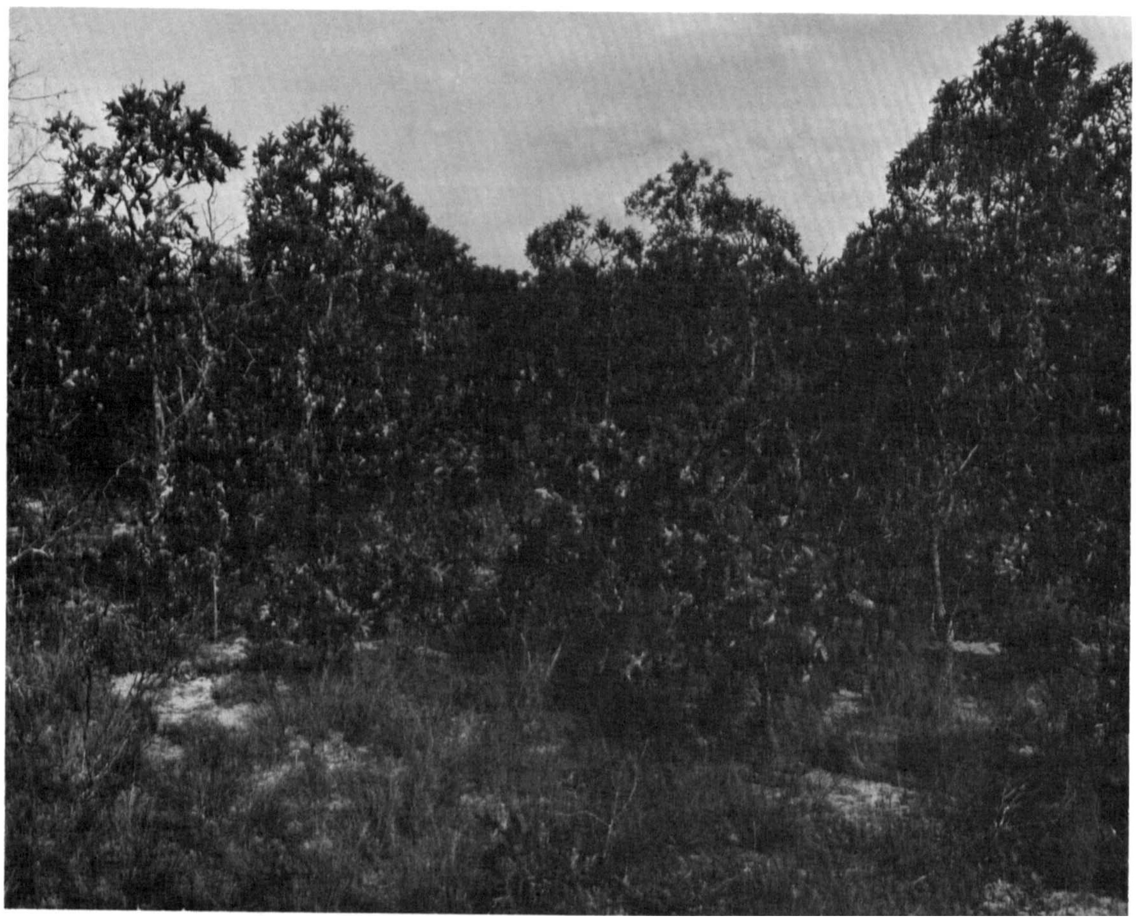


Figure 7.—Typical vegetation in this area of Kershaw sand, 2 to 8 percent slopes, consists of turkey oak and grasses.

Figure 8.—Typical profile of Tifton loamy sand, 2 to 5 percent slopes.

Figure 9.—Severe erosion has occurred in this tobacco field on Tifton sandy loam, 5 to 8 percent slopes, eroded, because the soils are unprotected by terraces or grassed waterways.

Figure 10.—Contouring of corn rows and the field road reduces erosion in this area of Cowarts loamy sand, 2 to 5 percent slopes.

Figure 11.—Tobacco plants in this area of Pelham loamy sand are drowned because of a high water table and a lack of adequate drainage.

Figure 12.—This pond is in an area of Pelham loamy sand. The dam, part of which is visible in foreground, has been seeded to grass.

Figure 13.—Use of parallel terraces and a bahiagrass waterway reduces erosion in this area of Tifton loamy sand, 2 to 5 percent slopes.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

[Data recorded in the period 1951 to 1974 at Glennville, Georgia]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	62.1	39.9	51.1	80	17	171	3.30	1.64	4.65	7	0
February---	64.7	41.5	53.1	82	20	164	3.88	2.19	5.24	7	0.2
March------	71.3	47.2	59.3	87	27	310	4.05	1.79	5.87	8	0
April------	79.0	54.5	66.8	91	37	504	3.57	1.82	4.99	5	0
May--------	85.8	61.8	73.8	97	46	738	4.20	2.09	5.91	6	0
June-------	89.7	67.7	78.8	100	55	864	5.27	2.99	7.13	8	0
July-------	91.6	70.7	81.2	100	62	967	6.70	3.95	9.15	11	0
August-----	91.2	70.6	80.9	99	62	958	5.42	3.63	7.05	9	0
September--	86.5	66.8	76.7	96	52	801	4.23	1.67	6.29	7	0
October----	79.0	56.6	67.8	92	36	552	2.12	.86	3.24	4	0
November---	69.9	46.3	58.2	84	25	252	2.02	.81	2.99	4	0
December---	63.5	41.1	52.3	81	20	169	3.30	1.91	4.43	6	0
Year-----	77.9	55.4	66.7	102	16	6,450	48.06	41.55	54.31	82	0.2

[1] A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data recorded in the period 1951 to 1974 at Glennville, Georgia]

Probability	Temperature: 24° F or lower	Temperature: 28° F or lower	Temperature: 32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	February 28	March 16	March 29
2 years in 10 later than--	February 18	March 8	March 23
5 years in 10 later than--	January 29	February 20	March 11
First freezing temperature in fall:			
1 year in 10 earlier than--	November 23	November 7	November 3
2 years in 10 earlier than--	December 1	November 15	November 8
5 years in 10 earlier than--	December 15	November 30	November 18

TABLE 3.--GROWING SEASON LENGTH

[Data recorded in the period 1951 to 1974 at Glennville, Georgia]

Probability	Daily minimum temperature during growing season: Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	291	247	229
8 years in 10	301	259	237
5 years in 10	320	281	251
2 years in 10	342	304	265
1 year in 10	362	316	272

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Candler County	Evans County	Tattnall County	Total--	
					Area	Extent
		Acres	Acres	Acres	Acres	Pct
AdA	Albany sand, 0 to 2 percent slopes	2,025	2,425	6,595	11,045	1.9
Bk	Bladen fine sandy loam	0	1,940	11,470	13,410	2.3
BoC	Bonifay fine sand, 1 to 8 percent slopes	11,825	8,785	16,085	36,695	6.2
BoD	Bonifay fine sand, 8 to 12 percent slopes	350	125	400	875	0.1
CaC2	Carnegie sandy loam, 5 to 8 percent slopes, eroded	1,540	1,815	5,525	8,880	1.5
CaD2	Carnegie sandy loam, 8 to 12 percent slopes, eroded	445	245	845	1,535	0.3
CoB	Cowarts loamy sand, 2 to 5 percent slopes	5,155	1,755	1,790	8,700	1.5
CoC	Cowarts loamy sand,'5 to 8 percent slopes	6,085	2,035	6,825	14,945	2.5
CrA	Craven fine sandy loam, 0 to 1 percent slopes	340	965	2,945	4,250	0.7
DoA	Dothan loamy sand, 0 to 2 percent slopes	2,335	895	1,525	4,755	0.8
DoB	Dothan loamy sand, 2 to 5 percent slopes	8,070	2,560	4,650	15,280	2.6
Em	Ellabelle loamy sand	85	1,595	2,670	4,350	0.7
FsB	Fuquay loamy sand, 1 to 5 percent slopes	21,265	15,635	32,065	68,965	11.6
FsC	Fuquay loamy sand, 5 to 8 percent slopes	2,290	1,515	3,510	7,315	1.2
Hz	Hydraquents	0	0	1,460	1,460	0.2
IgA	Irvington loamy sand, 0 to 2 percent slopes	75	1,320	5,425	6,820	1.2
KeC	Kershaw sand, 2 to 8 percent slopes	11,335	3,745	23,675	38,755	6.5
KuD	Kureb sand, 5 to 12 percent slopes	385	0	1,135	1,520	0.3
Le	Leefield loamy sand	7,885	5,570	19,863	33,318	5.6
OS	Osier soils	29,633	19,905	32,250	81,788	13.8
Pe	Pelham loamy sand	19,682	24,095	52,340	96,117	16.2
Ru	Rutlege sand	1,535	1,085	7,835	10,455	1.8
Se	Stilson loamy sand	1,165	1,585	4,604	7,354	1.2
TfA	Tifton loamy sand, 0 to 2 percent slopes	5,830	7,075	23,510	36,415	6.1
TfB	Tifton loamy sand, 2 to 5 percent slopes	19,311	11,438	29,000	59,749	10.1
TsC2	Tifton sandy loam, 5 to 8 percent slopes, eroded	1,610	740	3,660	6,010	1.0
WA	Wahee Association	0	0	11,815	11,815	2.0
	Water areas (larger than 40 acres)	250	325	200	775	0.1
	Total	160,506	119,173	313,672	593,351	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield figure indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn	Peanuts	Wheat	Soybeans	Tobacco	Improved bermuda-grass	Bahiagrass
	Bu	Lb	Bu	Bu	Lb	AUM*	AUM*
AdA----------------------- Albany	65	1,700	---	25	2,100	7.0	6.5
Bk------------------------ Bladen	---	---	---	---	---	---	---
BoC----------------------- Bonifay	50	1,600	---	20	---	5	5
BoD----------------------- Bonifay	---	---	---	---	---	5	5
CaC2---------------------- Carnegie	60	1,800	---	20	2,000	6.0	6.5
CaD2---------------------- Carnegie	---	---	---	---	---	---	---
CoB----------------------- Cowarts	80	2,000	---	25	2,200	8.0	8.0
CoC----------------------- Cowarts	70	1,800	---	20	2,000	7.5	7.0
CrA----------------------- Craven	100	2,500	---	30	2,400	---	8.0
DoA----------------------- Dothan	90	3,000	55	40	2,600	9	8
DoB----------------------- Dothan	80	2,800	50	35	2,500	9	8
Em------------------------ Ellabelle	---	---	---	---	---	---	---
FsB----------------------- Fuquay	80	2,700	---	30	2,400	7.5	7.0
FsC----------------------- Fuquay	75	2,500	---	25	2,200	6.5	6.0
IgA----------------------- Irvington	85	2,600	---	40	2,400	8	9.0
KeC----------------------- Kershaw	---	---	---	---	---	3.5	3.5
KuD----------------------- Kureb	---	---	---	---	---	---	---
Le------------------------ Leefield	85	2,200	---	25	2,300	8.7	8.0
OS**---------------------- Osier	---	---	---	---	---	---	5.0
Pe------------------------ Pelham	40	---	---	---	---	---	5.5

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Peanuts	Wheat	Soybeans	Tobacco	Improved bermuda-grass	Bahiagrass
	Bu	Lb	Bu	Bu	Lb	AUM*	AUM*
Ru------------------------ Rutlege	---	---	---	---	---	---	---
Se------------------------ Stilson	80	3,100	---	35	2,600	10.0	7.5
TfA----------------------- Tifton	100	3,100	55	46	2,600	10.5	8.5
TfB----------------------- Tifton	100	3,100	50	46	2,600	10.5	8.5
TsC2---------------------- Tifton	80	2,600	45	34	2,200	9.0	7.0
WA**. Wahee							

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	
I	41,170	---	---	---	---
II	204,436	83,729	51,742	68,965	---
III	39,315	20,955	11,045	7,315	---
IV	57,390	8,880	11,815	36,695	---
V	195,665	---	195,665	---	---
VI	12,865	1,535	10,455	875	---
VII	41,735	1,460	---	40,275	---
VIII	---	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Important trees	Site index	
AdA----------------- Albany	3w	Slight	Moderate	Moderate	Loblolly pine---------- Slash pine------------ Longleaf pine----------	80 80 67	Loblolly pine, slash pine.
Bk*----------------- Bladen	2w	Slight	Severe	Severe	Loblolly pine---------- Slash pine------------ Sweetgum---------------	94 91 90	Loblolly pine, slash pine, American sycamore, water oak, Nuttall oak.
BoC, BoD----------- Bonifay	3s	Slight	Moderate	Moderate	Slash pine------------ Longleaf pine---------- Loblolly pine----------	80 65 80	Slash pine.
CaC2, CaD2--------- Carnegie	2o	Slight	Slight	Slight	Loblolly pine---------- Slash pine------------ Longleaf pine----------	86 86 70	Loblolly pine, slash pine.
CoB, CoC----------- Cowarts	2o	Slight	Slight	Slight	Loblolly pine---------- Slash pine------------ Longleaf pine----------	86 86 70	Loblolly pine, slash pine.
CrA----------------- Craven	3w	Slight	Moderate	Slight	Loblolly pine---------- Longleaf pine---------- Water oak--------------	81 67 80	Loblolly pine, slash pine.
DoA, DoB----------- Dothan	2o	Slight	Slight	Slight	Slash pine------------ Loblolly pine---------- Longleaf pine----------	90 90 70	Slash pine, loblolly pine, longleaf pine.
Em*----------------- Ellabelle	2w	Slight	Severe	Severe	Loblolly pine---------- Slash pine------------ Pond pine-------------- Blackgum--------------- Water oak-------------- Baldcypress------------	90 90 70 --- --- ---	Loblolly pine, slash pine, sweetgum.
FsB, FsC----------- Fuquay	3s	Slight	Moderate	Moderate	Loblolly pine---------- Slash pine------------ Longleaf pine----------	83 83 67	Slash pine, longleaf pine.
IgA----------------- Irvington	2w	Slight	Moderate	Slight	Slash pine------------ Loblolly pine---------- Longleaf pine---------- Sweetgum--------------- Water oak-------------- Yellow-poplar----------	90 90 70 90 85 90	Slash pine, loblolly pine, longleaf pine, cherrybark oak, American sycamore, yellow-poplar.
KeC----------------- Kershaw	5s	Slight	Moderate	Severe	Slash pine------------ Longleaf pine----------	65 55	Sand pine, slash pine, longleaf pine.
KuD----------------- Kureb	5s	Slight	Severe	Severe	Longleaf pine---------- Slash pine------------ Sand pine--------------	50 60 ---	Longleaf pine, slash pine.
Le------------------ Leefield	3w	Slight	Moderate	Moderate	Loblolly pine---------- Slash pine------------ Longleaf pine----------	84 84 70	Loblolly pine, slash pine.
OS* **------------- Osier	3w	Slight	Severe	Severe	Slash pine------------ Loblolly pine---------- Longleaf pine----------	80 80 68	Slash pine, loblolly pine.

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Important trees	Site index	
Pe*: Pelham	2w	Slight	Severe	Severe	Slash pine	90	Slash pine, loblolly pine.
					Loblolly pine	90	
					Longleaf pine	74	
					Sweetgum	80	
					Water oak	80	
Ru*: Rutlege	2w	Slight	Severe	Severe	Loblolly pine	90	Loblolly pine, baldcypress, slash pine.
					Sweetgum	90	
					Slash pine	90	
Se: Stilson	3s	Slight	Moderate	Slight	Loblolly pine	83	Slash pine, loblolly pine, longleaf pine.
					Slash pine	83	
					Longleaf pine	70	
					Sweetgum	---	
TfA, TfB, TsC2: Tifton	2o	Slight	Slight	Slight	Loblolly pine	86	Loblolly pine, slash pine.
					Slash pine	86	
					Longleaf pine	68	
WA**: Wahee	2w	Slight	Moderate	Moderate	Loblolly pine	86	Loblolly pine, slash pine, sweetgum, American sycamore, water oak, yellow-poplar, cherrybark oak.
					Slash pine	86	
					Sweetgum	90	
					Yellow-poplar		

* Tree planting is feasible only in areas that have adequate surface drainage, and potential productivity is attainable only in areas that have adequate surface drainage.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
AdA: Albany	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
Bk: Bladen	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
BoC: Bonifay	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight.
BoD: Bonifay	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
CaC2: Carnegie	Slight	Slight	Slight	Moderate: slope.	Slight.
CaD2: Carnegie	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
CoB: Cowarts	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
CoC: Cowarts	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight.
CrA: Craven	Severe: too clayey.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: shrink-swell.
DoA, DoB: Dothan	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight.
Em: Ellabelle	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
FsB: Fuquay	Slight	Slight	Slight	Slight	Slight.
FsC: Fuquay	Slight	Slight	Slight	Moderate: slope.	Slight.
IgA: Irvington	Severe: wetness.	Moderate: low strength, wetness.	Severe: wetness.	Moderate: wetness, low strength.	Moderate: low strength.
KeC: Kershaw	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight.
KuD: Kureb	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Le: Leefield	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
OS*: Osier	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Pe----------------- Pelham	Severe: floods, wetness, cutbanks cave.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Ru----------------- Rutlege	Severe: wetness, cutbanks cave, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
Se----------------- Stilson	Moderate: wetness.	Slight-----------	Moderate: wetness.	Slight------------	Slight.
TfA, TfB---------- Tifton	Slight-----------	Slight-----------	Slight-----------	Slight------------	Slight.
TsC2-------------- Tifton	Slight-----------	Slight-----------	Slight-----------	Moderate: slope.	Slight.
WA*---------------- Wahee	Severe: floods, too clayey.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, low strength.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," and "fair"]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AdA: Albany	Severe: wetness.	Severe: seepage.	Severe: wetness.	Moderate: wetness.	Fair: too sandy.
Bk: Bladen	Severe: wetness, floods.	Slight	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness, too clayey.
BoC: Bonifay	Slight	Moderate: seepage.	Slight	Slight	Poor: too sandy, seepage.
BoD: Bonifay	Moderate: slope.	Severe: slope, seepage.	Slight	Moderate: slope.	Poor: too sandy, seepage.
CaC2: Carnegie	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Good.
CaD2: Carnegie	Severe: percs slowly.	Severe: slope.	Slight	Moderate: slope.	Fair: slope.
CoB, CoC: Cowarts	Severe: percs slowly, wetness.	Moderate: slope, wetness.	Moderate: wetness.	Severe: wetness.	Fair: thin layer, area reclaim.
CrA: Craven	Severe: percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: too clayey.
DoA: Dothan	Moderate: percs slowly.	Slight	Moderate: wetness.	Moderate: wetness.	Good.
DoB: Dothan	Moderate: percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Good.
Em: Ellabelle	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
FsB, FsC: Fuquay	Moderate: percs slowly.	Moderate: slope.	Slight	Slight	Good.
IgA: Irvington	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Good.
KeC: Kershaw	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy.
KuD: Kureb	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy.
Le: Leefield	Severe: wetness, percs slowly.	Moderate: wetness, seepage.	Severe: wetness.	Severe: wetness.	Good.
OS*: Osier	Severe: floods, wetness.	Severe: floods, seepage.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness, too sandy.
Pe: Pelham	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ru: Rutlege	Severe: wetness, floods.	Severe: seepage, wetness.	Severe: wetness, seepage, floods.	Severe: wetness, seepage, floods.	Poor: wetness.
Se: Stilson	Severe: wetness.	Moderate: seepage.	Moderate: wetness.	Slight	Good.
TfA: Tifton	Moderate: percs slowly.	Moderate: seepage.	Slight	Slight	Good.
TfB, TsC2: Tifton	Moderate: percs slowly.	Moderate: slope, seepage.	Slight	Slight	Good.
WA*: Wahee	Severe: wetness, percs slowly.	Severe: floods.	Severe: wetness, floods.	Severe: wetness, floods.	Poor: too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor"]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AdA----- Albany	Fair: wetness.	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
Bk----- Bladen	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
BoC----- Bonifay	Good-----	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy.
BoD----- Bonifay	Fair: slope.	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy, slope.
CaC2, CaD2----- Carnegie	Good-----	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
CoB, CoC----- Cowarts	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
CrA----- Craven	Poor: thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
DoA, DoB----- Dothan	Fair-----	Poor: excess fines.	Poor: excess fines.	Fair.
Em----- Ellabelle	Poor: wetness.	Poor: excess fines.	Unsuited: excess fines.	Poor: wetness.
FsB, FsC----- Fuquay	Good-----	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
IgA----- Irvington	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
KeC----- Kershaw	Good-----	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy.
KuD----- Kureb	Good-----	Good-----	Unsuited: excess fines.	Poor: too sandy.
Le----- Leefield	Fair: wetness.	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
OS*----- Osier	Poor: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy, wetness.
Pe----- Pelham	Poor: wetness.	Poor: excess fines.	Unsuited: excess fines.	Poor: wetness.
Ru----- Rutlege	Poor: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy, wetness.
Se----- Stilson	Good-----	Poor: excess fines.	Poor: excess fines.	Poor: too sandy.
TfA, TfB, TsC2----- Tifton	Good-----	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
WA*----- Wahee	Poor: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, area reclaim.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
AdA: Albany	Moderate: seepage.	Moderate: seepage.	Favorable	Fast intake	Favorable	Favorable.
Bk: Bladen	Slight	Moderate: low strength.	Floods, percs slowly.	Wetness, percs slowly.	Not needed	Wetness, percs slowly.
BoC, BoD: Bonifay	Severe: seepage.	Severe: seepage, piping.	Not needed	Fast intake, slope, droughty.	Not needed	Droughty.
CaC2: Carnegie	Moderate: seepage.	Slight	Not needed	Slope	Favorable	Favorable.
CaD2: Carnegie	Moderate: seepage.	Slight	Not needed	Slope	Slope	Slope.
CoB: Cowarts	Slight	Slight	Not needed	Percs slowly	Favorable, percs slowly.	Favorable, percs slowly.
CoC: Cowarts	Slight	Slight	Not needed	Slope, percs slowly.	Favorable, percs slowly.	Favorable, percs slowly.
CrA: Craven	Slight	Moderate: piping.	Percs slowly	Erodes easily, percs slowly.	Percs slowly	Percs slowly.
DoA, DoB: Dothan	Slight	Slight	Not needed	Favorable	Favorable	Favorable.
Em: Ellabelle	Moderate: seepage.	Moderate: piping.	Floods, wetness, poor outlets.	Wetness, floods.	Not needed	Not needed.
FsB, FsC: Fuquay	Slight	Moderate: piping.	Not needed	Fast intake	Favorable	Favorable.
IgA: Irvington	Slight	Moderate: low strength.	Percs slowly	Favorable	Favorable	Favorable.
KeC: Kershaw	Severe: seepage.	Severe: seepage.	Not needed	Droughty, fast intake.	Too sandy	Droughty.
KuD: Kureb	Severe: seepage.	Severe: seepage.	Not needed	Fast intake, seepage.	Too sandy	Droughty.
Le: Leefield	Moderate: seepage.	Moderate: seepage, piping.	Favorable	Fast intake	Not needed	Not needed.
OS*: Osier	Severe: seepage.	Severe: seepage, unstable fill.	Floods, cutbanks cave.	Floods, seepage.	Not needed	Not needed.
Pe: Pelham	Moderate: seepage.	Moderate: piping.	Floods, wetness.	Floods, wetness.	Not needed	Not needed.
Ru: Rutlege	Severe: seepage.	Severe: seepage, unstable fill, piping.	Cutbanks cave, wetness, floods.	Wetness, fast intake, droughty.	Not needed	Not needed.
Se: Stilson	Moderate: seepage.	Moderate: seepage.	Favorable	Fast intake	Not needed	Not needed.
TfA, TfB: Tifton	Moderate: seepage.	Slight	Not needed	Favorable	Favorable	Favorable.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
TsC2 Tifton	Slight	Slight	Not needed	Slope	Favorable	Favorable.
WA* Wahee	Slight	Severe: wetness.	Percs slowly, floods.	Percs slowly, slow intake.	Not needed	Wetness, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
AdA------------------- Albany	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Bk-------------------- Bladen	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness.
BoC------------------- Bonifay	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.
BoD------------------- Bonifay	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.
CaC2------------------ Carnegie	Slight---------------	Slight---------------	Severe: slope.	Slight.
CaD2------------------ Carnegie	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
CoB------------------- Cowarts	Slight---------------	Slight---------------	Moderate: slope.	Slight.
CoC------------------- Cowarts	Slight---------------	Slight---------------	Severe: slope.	Slight.
CrA------------------- Craven	Moderate: percs slowly.	Slight---------------	Moderate: percs slowly.	Slight.
DoA------------------- Dothan	Slight---------------	Slight---------------	Slight---------------	Slight.
DoB------------------- Dothan	Slight---------------	Slight---------------	Moderate: slope.	Slight.
Em-------------------- Ellabelle	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
FsB------------------- Fuquay	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.
FsC------------------- Fuquay	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.
IgA------------------- Irvington	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
KeC------------------- Kershaw	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
KuD------------------- Kureb	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
Le-------------------- Leefield	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
OS*------------------- Osier	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Pe: Pelham	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Moderate: floods, too sandy.
Ru: Rutlege	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, too sandy.	Severe: wetness.
Se: Stilson	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: too sandy.
TfA: Tifton	Slight	Slight	Slight	Slight.
TfB: Tifton	Slight	Slight	Moderate: slope.	Slight.
TsC2: Tifton	Slight	Slight	Severe: slope.	Slight.
WA*: Wahee	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Moderate: wetness, floods.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor"]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AdA: Albany	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor
Bk: Bladen	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
BoC, BoD: Bonifay	Poor	Fair	Poor	Poor	Poor	Very poor	Very poor	Poor	Fair	Very poor
CaC2, CaD2: Carnegie	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
CoB, CoC: Cowarts	Fair	Fair	Good	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
CrA: Craven	Good	Good	Good	Good	Good	Poor	Good	Good	Good	Poor
DoA, DoB: Dothan	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Em: Ellabelle	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
FsB: Fuquay	Fair	Fair	Good	Fair	Fair	Poor	Very poor	Good	Fair	Very poor
FsC: Fuquay	Poor	Fair	Good	Fair	Fair	Poor	Very poor	Good	Fair	Very poor
IgA: Irvington	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
KeC: Kershaw	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor	Very poor	Very poor
KuD: Kureb	Very poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Poor	Very poor	Very poor
Le: Leefield	Fair	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair
OS*: Osier	Very poor	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair
Pe: Pelham	Poor	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair
Ru: Rutlege	Very poor	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair
Se: Stilson	Fair	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Poor
TfA: Tifton	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
TfB: Tifton	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
TsC2: Tifton	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
WA*: Wahee	Poor	Fair	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
AdA----------------- Albany	0-47	Sand------------	SM	A-2	0	100	100	75-90	12-23	---	NP
	47-54	Sandy loam------	SM	A-2	0	100	100	75-92	22-30	---	NP
	54-72	Sandy clay loam, sandy loam.	SC, SM, SM-SC	A-2, A-4	0	97-100	95-100	70-90	25-38	<35	NP-17
Bk------------------ Bladen	0-8	Fine sandy loam	SM	A-2, A-4	0	100	97-100	60-85	20-50	---	NP
	8-64	Clay, sandy clay	CL, CH	A-7	0	100	99-100	75-100	55-85	45-65	23-45
BoC, BoD----------- Bonifay	0-57	Fine sand-------	SP-SM	A-3, A-2-4	0	98-100	98-100	60-95	5-12	---	NP
	57-80	Sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2-4, A-4	0	95-100	90-100	70-95	30-50	<30	NP-10
CaC2, CaD2--------- Carnegie	0-6	Sandy loam------	SM, SM-SC	A-2	0	65-85	60-80	51-75	13-30	<25	NP-5
	6-18	Sandy clay loam	SC, SM	A-6, A-2, A-4	0	80-100	60-95	55-80	29-50	25-35	8-15
	18-37	Sandy clay loam	SC	A-6	0	90-100	80-95	75-95	36-50	25-40	11-20
	37-65	Sandy clay loam, sandy clay.	CL, SC	A-7, A-6	0	95-100	90-100	75-100	40-65	30-50	11-25
CoB, CoC----------- Cowarts	0-11	Loamy sand------	SM	A-2	0	95-100	92-100	60-80	13-30	---	NP
	11-17	Sandy clay loam, sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	90-100	68-90	23-45	<40	NP-15
	17-70	Sandy clay loam, sandy clay.	SM-SC, SC	A-2, A-4, A-6, A-7	0	85-100	80-100	70-95	30-50	25-45	4-20
CrA---------------- Craven	0-8	Fine sandy loam	ML, CL-ML	A-4	0	100	100	75-100	51-70	<25	NP-7
	8-46	Clay, silty clay, silty clay loam.	CH, MH	A-7	0	100	100	90-100	70-95	51-60	18-35
	46-68	Clay, sandy clay loam, clay loam.	CH, CL, SC	A-7, A-6	0	100	100	80-100	36-85	30-55	11-35
DoA, DoB----------- Dothan	0-10	Loamy sand------	SM	A-2	0	95-100	92-100	60-80	13-30	---	NP
	10-38	Sandy clay loam, sandy loam.	SM-SC, SC, SM	A-2, A-4, A-6	0	95-100	92-100	68-90	23-45	<40	NP-15
	38-70	Sandy clay loam, sandy clay.	SM-SC, SC	A-2, A-4, A-6, A7	0	95-100	92-100	70-95	30-50	25-45	4-18
Em----------------- Ellabelle	0-37	Loamy sand------	SM, SP-SM	A-2, A-1	0	100	95-100	48-75	11-26	---	NP
	37-65	Sandy clay loam, sandy clay.	SC, CL	A-6, A-7	0	100	95-100	65-90	36-52	32-46	15-25

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
FsB, FsC----------- Fuquay	0-28	Loamy sand------	SP-SM, SM	A-2, A-3	0	95-100	90-100	50-83	5-35	---	NP
	28-46	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	85-100	85-100	60-80	23-45	<25	NP-13
	46-68	Sandy clay loam	SC, CL	A-2, A-4, A-6	0	95-100	90-100	60-93	28-55	20-39	8-25
IgA---------------- Irvington	0-14	Loamy sand------	SM	A-2	0	90-100	75-100	70-99	20-30	---	NP
	14-34	Loam, sandy clay loam, clay loam.	CL, SC, CL-ML, SM-SC	A-4	0	80-100	70-99	65-98	40-70	20-30	4-10
	34-64	Loam, sandy clay loam, clay loam.	CL, SC, CL-ML, SM-SC	A-4, A-6	0	80-98	70-97	70-92	36-55	25-35	4-12
KeC---------------- Kershaw	0-83	Sand------------	SP, SP-SM	A-2, A-3	0	98-100	98-100	50-80	1-7	---	NP
KuD---------------- Kureb	0-80	Sand------------	SP	A-3	0	100	100	60-95	0-5	---	NP
Le----------------- Leefield	0-26	Loamy sand------	SM, SW-SM, SP-SM	A-2	0	98-100	95-100	65-95	10-20	---	NP
	26-46	Sandy loam, sandy clay loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	95-100	93-100	65-95	20-40	<40	NP-16
	46-66	Sandy loam, sandy clay loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	95-100	95-100	65-90	20-40	<40	NP-20
OS*---------------- Osier	0-6	Loamy fine sand	SM	A-2	0	100	98-100	70-90	13-25	---	NP
	6-62	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	95-100	65-90	5-20	---	NP
Pe----------------- Pelham	0-32	Loamy sand------	SM	A-2	0	100	95-100	75-90	15-30	---	NP
	32-72	Sandy clay loam, sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	95-100	65-90	30-50	15-30	2-12
Ru----------------- Rutlege	0-38	Sand------------	SM, SP-SM	A-2, A-3	0	95-100	95-100	50-80	5-25	<25	NP
	38-70	Sand, loamy sand, loamy fine sand.	SP-SM, SP, SM	A-2, A-3	0	95-100	95-100	50-80	2-25	<20	NP
Se----------------- Stilson	0-26	Loamy sand------	SM	A-2	---	94-100	94-100	74-92	15-24	---	NP
	26-35	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-6, A-4	---	89-100	86-100	77-94	28-41	<29	NP-13
	35-66	Sandy loam, sandy clay loam.	SM, SC	A-2, A-6	---	96-100	95-100	70-99	30-50	<40	NP-20

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
TfA, TfB----------- Tifton	0-9	Loamy sand------	SM, SP-SM, SM-SC	A-2	0	70-95	62-89	53-85	11-27	<25	NP-5
	9-12	Sandy loam, sandy clay loam.	SM, SM-SC	A-2	0	70-95	56-89	55-89	20-35	<25	NP-7
	12-36	Sandy clay loam	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	70-95	65-89	60-81	33-53	22-40	5-20
	36-62	Sandy clay loam	SC, CL	A-2, A-6, A-7	0	87-100	80-99	70-94	34-55	24-45	11-21
TsC2--------------- Tifton	0-7	Sandy loam------	SM, SM-SC	A-2	0	70-95	60-89	55-89	15-30	<25	NP-6
	7-14	Sandy loam, sandy clay loam.	SM, SM-SC	A-2	0	70-95	56-89	55-89	20-35	<25	NP-7
	14-31	Sandy clay loam	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	70-95	65-89	60-81	33-53	22-40	5-20
	31-72	Sandy clay loam	SC, CL	A-2, A-6, A-7	0	87-100	80-99	70-94	34-55	24-45	11-21
WA*---------------- Wahee	0-3	Loam------------	ML, CL-ML, CL	A-4	0	100	100	90-98	51-75	20-35	2-10
	3-36	Clay, clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	70-90	41-60	18-32
	36-54	Variable--------	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permea-bility	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
AdA: Albany	0-47	6.0-20	0.02-0.04	4.5-5.5	Low	Moderate	High	0.17	5
	47-54	2.0-6.0	0.08-0.10	4.5-5.5	Low	Moderate	High	0.20	
	54-72	0.6-2.0	0.10-0.16	4.5-5.5	Low	High	High	0.24	
Bk: Bladen	0-8	0.6-2.0	0.10-0.13	3.6-5.5	Low	High	High	0.10	---
	8-64	0.06-0.2	0.12-0.16	3.6-5.5	Moderate	High	High	---	
BoC, BoD: Bonifay	0-57	6.0-20	0.03-0.08	4.5-5.5	Low	Low	High	0.17	5
	57-80	0.6-2.0	0.10-0.15	4.5-5.5	Low	Low	High	0.24	
CaC2, CaD2: Carnegie	0-6	2.0-6.0	0.05-0.08	4.5-6.0	Low	Low	Moderate	0.28	3
	6-18	0.6-2.0	0.10-0.14	4.5-5.5	Low	Low	Moderate	0.32	
	18-37	0.2-0.6	0.10-0.13	4.5-5.5	Low	Low	Moderate	0.24	
	37-65	0.2-0.6	0.10-0.14	4.5-5.5	Low	Low	Moderate	0.28	
CoB, CoC: Cowarts	0-11	2.0-6.0	0.06-0.10	4.5-5.5	Very low	Moderate	Moderate	0.20	3
	11-17	0.6-2.0	0.10-0.14	4.5-5.5	Low	Moderate	Moderate	0.28	
	17-70	0.06-0.2	0.08-0.12	4.5-5.5	Low	Moderate	Moderate	0.24	
CrA: Craven	0-8	0.6-2.0	0.12-0.18	4.5-6.0	Low	High	High	0.37	3
	8-46	<0.2	0.12-0.15	4.5-5.5	Moderate	High	High	0.32	
	46-68	<0.2	0.12-0.15	4.5-5.5	Moderate	High	High	0.32	
DoA, DoB: Dothan	0-10	2.0-6.0	0.06-0.10	4.5-5.5	Very low	Moderate	Moderate	0.20	4
	10-38	0.6-2.0	0.10-0.14	4.5-5.5	Low	Moderate	Moderate	0.28	
	38-70	0.2-0.6	0.08-0.12	4.5-5.5	Low	Moderate	Moderate	0.28	
Em: Ellabelle	0-37	2.0-6.0	0.05-0.08	4.5-5.5	Very low	High	High	0.10	5
	37-65	0.6-2.0	0.12-0.18	4.5-5.5	Low	High	High	0.15	
FsB, FsC: Fuquay	0-28	>6.0	0.04-0.09	4.5-5.5	Low	Low	High	0.20	5
	28-46	0.6-2.0	0.12-0.15	4.5-5.5	Low	Low	High	0.20	
	46-68	0.06-0.2	0.10-0.13	4.5-5.5	Low	Low	High	0.20	
IgA: Irvington	0-14	0.6-2.0	0.10-0.15	4.5-6.0	Low	Moderate	Moderate	0.32	3
	14-34	0.6-2.0	0.12-0.18	4.5-5.5	Low	Moderate	Moderate	0.28	
	34-64	0.06-0.2	0.12-0.18	4.5-5.5	Low	Moderate	Moderate	0.28	
KeC: Kershaw	0-83	>20	0.02-0.05	4.5-5.5	Very low	Low	High	0.15	5
KuD: Kureb	0-80	6.0-20	<0.05	4.5-7.3	Low	Low	Low	0.17	4
Le: Leefield	0-26	6.0-20	0.04-0.07	4.5-6.0	Low	Low	Low	0.10	---
	26-46	0.6-2.0	0.10-0.13	4.5-5.5	Low	Moderate	High	0.15	
	46-66	0.2-0.6	0.08-0.12	4.5-5.5	Low	Moderate	High	0.10	
OS*: Osier	0-6	6.0-20	0.10-0.15	4.5-6.0	Low	High	High	---	---
	6-62	6.0-20	0.03-0.10	4.5-6.0	Low	High	High	---	
Pe: Pelham	0-32	6.0-20	0.05-0.08	4.5-5.5	Very low	High	High	0.10	5
	32-72	0.6-2.0	0.10-0.13	4.5-5.5	Low	High	High	0.24	
Ru: Rutlege	0-38	6.0-20	0.04-0.10	3.6-5.0	Low	High	High	---	---
	38-70	6.0-20	0.04-0.08	3.6-5.0	Low	High	High	---	
Se: Stilson	0-26	6.0-20	0.06-0.09	4.5-5.5	Low	Low	High	0.17	5
	26-35	0.6-2.0	0.09-0.12	4.5-5.5	Low	Moderate	High	0.24	
	35-66	0.6-2.0	0.08-0.10	4.5-5.5	Low	Moderate	High	0.17	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permea- bility	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
TfA, TfB-----------	0-9	6.0-20	0.03-0.08	4.5-5.5	Low-----------	Low-------	Moderate	0.20	4
Tifton	9-12	6.0-20	0.08-0.12	4.5-5.5	Low-----------	Low-------	Moderate	0.24	
	12-36	0.6-2.0	0.12-0.15	4.5-5.5	Low-----------	Low-------	Moderate	0.24	
	36-62	0.6-2.0	0.10-0.13	4.5-5.5	Low-----------	Low-------	Moderate	0.17	
TsC2---------------	0-7	6.0-20	0.06-0.10	4.5-5.5	Low-----------	Low-------	Moderate	0.24	4
Tifton	7-14	6.0-20	0.08-0.12	4.5-5.5	Low-----------	Low-------	Moderate	0.24	
	14-31	0.6-2.0	0.12-0.15	4.5-5.5	Low-----------	Low-------	Moderate	0.24	
	31-72	0.6-2.0	0.10-0.13	4.5-5.5	Low-----------	Low-------	Moderate	0.17	
WA*----------------	0-3	0.2-2.0	0.15-0.20	4.5-5.5	Low-----------	High------	High------	0.28	5
Wahee	3-36	0.06-0.2	0.12-0.20	4.5-5.5	Moderate-----	High------	High------	0.28	
	36-54	0.2-0.6	0.12-0.20	4.5-5.5	Moderate-----	High------	High------	0.28	

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

[The definitions of "flooding" and "water table" in the Glossary explain terms such as "rare," "brief," "apparent," and "perched." The symbol > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness
					Ft			In	
AdA---------------- Albany	C	Rare---------	---	---	1.0-2.5	Apparent	Dec-Mar	>60	---
Bk---------------- Bladen	D	Common------	Long------	Jan-Apr	0-1.0	Apparent	Dec-May	>60	---
BoC, BoD---------- Bonifay	A	None---------	---	---	>6.0	---	---	>60	---
CaC2, CaD2-------- Carnegie	C	None---------	---	---	>6.0	---	---	>60	---
CoB, CoC---------- Cowarts	C	None---------	---	---	2.0-3.0	Perched	Jan-Mar	>60	---
CrA---------------- Craven	C	None---------	---	---	2.0-3.0	Apparent	Dec-Mar	>60	---
DoA, DoB---------- Dothan	B	None---------	---	---	3.5-4.0	Perched	Jan-Apr	>60	---
Em---------------- Ellabelle	D	Frequent----	Very long	Nov-Apr	1-0.5	Apparent	Nov-Apr	>60	---
FsB, FsC---------- Fuquay	B	None---------	---	---	2.5-4.0	Perched	Jan-Mar	>60	---
IgA---------------- Irvington	C	None---------	---	---	1.5-3.0	Perched	Dec-Apr	>60	---
KeC---------------- Kershaw	A	None---------	---	---	>6.0	---	---	>60	---
KuD---------------- Kureb	A	None---------	---	---	>6.0	---	---	>60	---
Le---------------- Leefield	C	None---------	---	---	1.5-2.5	Apparent	Dec-Mar	>60	---
OS*---------------- Osier	D	Common------	Long------	Dec-Apr	0.0-1.0	Apparent	Nov-Mar	>60	---
Pe---------------- Pelham	B/D	Common------	Brief-----	Dec-Mar	0.5-1.5	Apparent	Jan-Apr	>60	---
Ru---------------- Rutlege	D	Common------	Long------	Dec-May	0-1.0	Apparent	Dec-May	>60	---
Se---------------- Stilson	B	None---------	---	---	2.5-3.0	Perched	Dec-Apr	>60	---
TfA, TfB, TsC2---- Tifton	B	None---------	---	---	>6.0	---	---	>60	---
WA*---------------- Wahee	D	None to common.	Brief-----	Dec-Mar	0.5-1.5	Apparent	Dec-Mar	>60	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--ENGINEERING TEST DATA

[Tests performed by Georgia Department of Transportation. NP means nonplastic]

Soil name and report number	Depth	Moisture density: Maximum dry density	Moisture density: Optimum moisture	Volume change: Shrinkage	Volume change: Swell	Volume change: Total	Percentage passing sieve--: 1-in	3/4 in	3/8 in	No. 4	No. 10	No. 40	No. 200	Percentage smaller than--: 0.05 mm	0.02 mm	0.005 mm	0.002 mm	Liquid limit	Plasticity index	Classification: AASHTO	Classification: Unified
	In	Lb/ft3	Pct																		
Kershaw[1]:																					
S68-GA-21-1-2	3-12	107	9	0.0	0.0	0.0	100	100	100	100	100	62	6	5	4	3	2	--	NP	A-2-4(0)	SP-SM
S68-GA-21-1-3	12-40	107	9	0.0	2.0	2.0	100	100	100	100	100	51	4	4	3	3	2	--	NP	A-2-4(0)	SP
Carnegie[2]:																					
S71-GA-54-6-1	0-6	124	9	1.1	1.2	2.3	100	97	87	82	78	54	13	10	8	6	4	--	NP	A-2-4(0)	SM
S71-GA-54-6-2	6-20	108	16	2.5	1.5	4.0	100	100	100	100	97	67	33	31	31	29	25	35	8	A-2-4(0)	SM
S71-GA-54-6-4	31-51	116	12	0.7	1.6	2.3	100	100	100	100	100	84	23	22	22	21	20	--	NP	A-2-4(0)	SM
Fuquay[3]:																					
S71-GA-54-2-2	9-27	118	8	1.4	0.1	1.5	100	100	100	100	100	83	16	11	11	7	6	--	NP	A-2-4(0)	SM
S71-GA-54-2-4	32-48	121	11	0.6	1.0	1.6	100	100	100	100	99	80	23	19	18	15	14	--	NP	A-2-4(0)	SM
S71-GA-54-2-5	48-70	113	13	1.0	0.2	1.2	100	100	98	96	94	77	26	23	22	20	18	--	NP	A-2-4(0)	SM
Leefield[4]:																					
S68-GA-132-9-2	9-22	116	9	0.8	8.8	9.6	100	100	100	100	100	90	20	16	13	9	7	--	NP	A-2-4(0)	SM
S68-GA-132-9-5	29-45	116	13	5.3	7.3	12.6	100	100	100	100	99	92	35	31	29	25	24	--	NP	A-2-4(0)	SM
S68-GA-132-9-6	45-80	112	13	5.3	3.9	9.2	100	99	97	96	95	88	32	30	28	25	24	27	7	A-2-4(0)	SM-SC
Leefield[5]:																					
S68-GA-132-10-2	7-24	116	10	1.0	7.5	8.5	100	100	100	99	98	85	20	15	12	8	7	--	NP	A-2-4(0)	SM
S68-GA-132-10-4	32-52	110	15	5.6	4.4	10.0	100	100	99	97	96	88	36	34	32	28	26	--	NP	A-4(0)	SM
S68-GA-132-10-5	52-85	110	15	3.7	7.7	11.4	100	100	99	99	98	88	32	31	30	28	27	--	NP	A-2-4(0)	SM
Stilson[6]:																					
S68-GA-132-7-2	9-29	116	10	0.4	3.6	4.0	100	100	100	100	100	83	16	12	9	5	4	--	NP	A-2-4(0)	SM
S68-GA-132-7-5	39-62	118	11	0.9	0.3	1.2	100	100	100	99	99	77	25	22	20	18	16	--	NP	A-2-4(0)	SM
S68-GA-132-7-6	62-80	113	16	3.0	7.0	10.0	100	100	100	100	100	80	31	31	29	27	26	34	17	A-2-6(1)	SC
Stilson[7]:																					
S68-GA-132-8-1	0-12	116	9	0.9	1.0	1.9	100	100	100	100	100	74	15	10	8	5	3	--	NP	A-2-4(0)	SM
S68-GA-132-8-5	38-58	118	13	2.9	0.5	3.4	100	100	95	89	86	80	31	29	27	22	20	28	10	A-2-4(0)	SC
S68-GA-132-8-6	58-85	115	14	3.5	1.5	5.0	100	100	98	96	95	70	30	29	28	24	22	31	12	A-2-6(0)	SC

[1] Candler County. In wooded area 300 yards west of Saul's Pond along Stillmore Road, and 100 feet north of road.

[2] Evans County. 1.9 miles southwest of Georgia Highway 129 along paved county road to Manassas, Georgia; then 0.3 mile east along county road.

[3] Evans County. 0.3 mile southeast of Seaboard Railroad in Hagan, Georgia along county paved road; 100 feet west.

[4] Tattnall County. 1/4 mile south of Evans County line along Georgia Highway 250, and 100 feet east of Highway.

[5] Tattnall County. 1.6 miles south of Evans County line along Georgia Highway 169, and 0.7 mile southeast along private road.

[6] Tattnall County. 3.2 miles north of Beards Creek Church on county paved road, 1/4 mile east on dirt road, and 400 feet southeast of road.

[7] Tattnall County. 2.2 miles east of Georgia Highway 121 in Collins, Georgia along Georgia Highway 292; turn right and cross Seaboard Railroad, turn left 1.3 miles along dirt road, 25 feet south.

TABLE 18.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

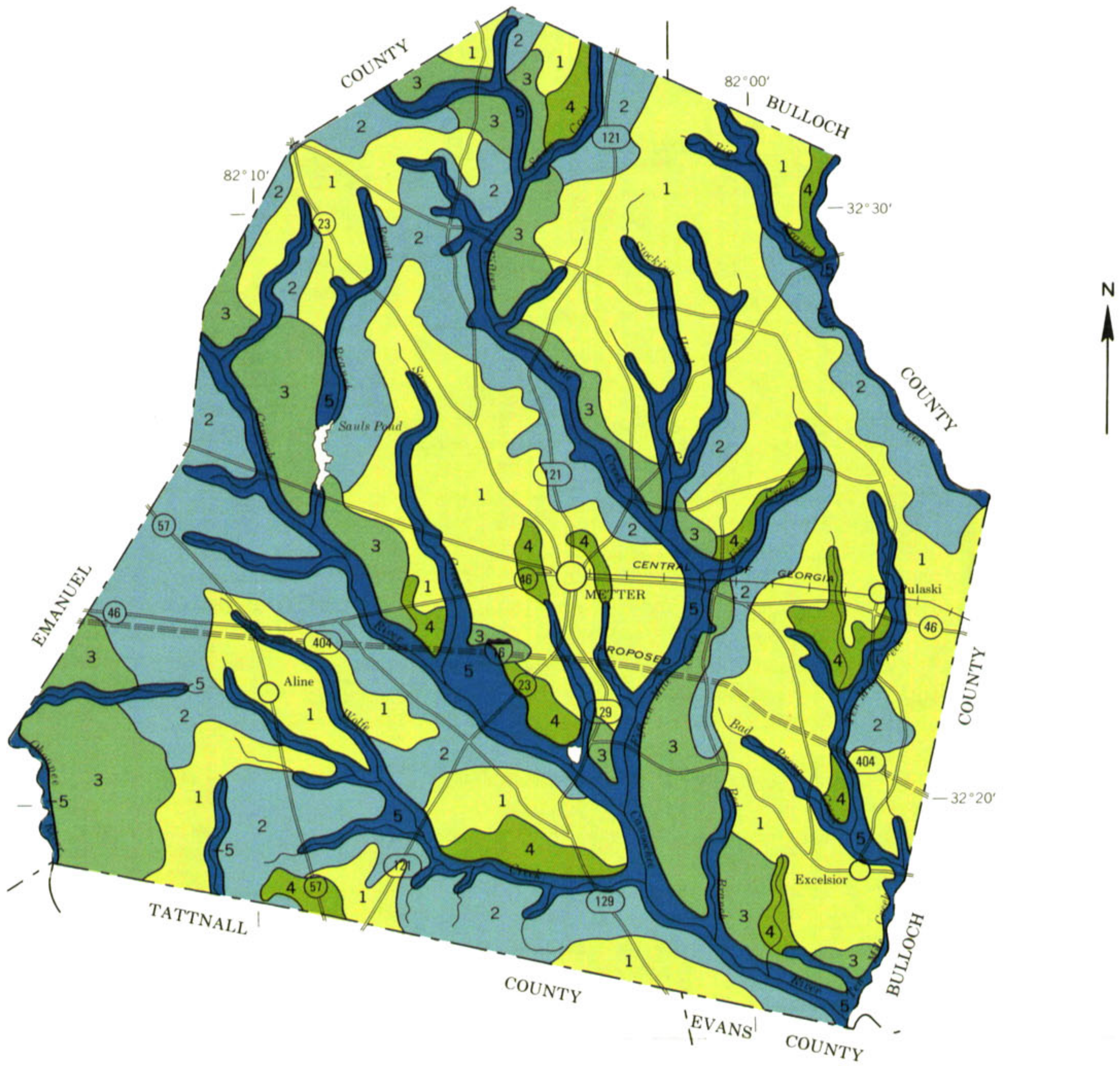
Soil name	Family or higher taxonomic class
Albany	Loamy, siliceous, thermic Grossarenic Paleudults
Bladen	Clayey, mixed, thermic Typic Albaquults
*Bonifay	Loamy, siliceous, thermic Grossarenic Plinthic Paleudults
Carnegie	Fine-loamy, siliceous, thermic Fragic Paleudults
Cowarts	Fine-loamy, siliceous, thermic Fragic Paleudults
*Craven	Clayey, mixed, thermic Aquic Hapludults
Dothan	Fine-loamy, siliceous, thermic Plinthic Paleudults
Ellabelle	Loamy, siliceous, thermic Arenic Umbric Paleaquults
Fuquay	Loamy, siliceous, thermic Arenic Plinthic Paleudults
*Hydraquents	Hydraquents
Irvington	Fine-loamy, siliceous, thermic Plinthic Fragiudults
Kershaw	Thermic, uncoated Typic Quartzipsamments
Kureb	Thermic, uncoated Spodic Quartzipsamments
Leefield	Loamy, siliceous, thermic Arenic Plinthaquic Paleudults
Osier	Siliceous, thermic Typic Psammaquents
Pelham	Loamy, siliceous, thermic Arenic Paleaquults
*Rutlege	Sandy, siliceous, thermic Typic Humaquepts
Stilson	Loamy, siliceous, thermic Arenic Plinthic Paleudults
Tifton	Fine-loamy, siliceous, thermic Plinthic Paleudults
Wahee	Clayey, mixed, thermic Aeric Ochraquults

☆ U.S. GOVERNMENT PRINTING OFFICE: 1980-270-219/60

NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.



LEGEND

- 1 — TIFTON-FUQUAY-DOTHAN: Well drained soils that have a loamy subsoil; on broad uplands; 0 to 8 percent slopes
- 2 — FUQUAY-COWARTS-BONIFAY: Well drained soils that have a loamy subsoil; on narrow ridgetops and short, irregular, convex hillsides; mostly 2 to 8 percent slopes
- 3 — KERSHAW-BONIFAY: Excessively drained and well drained soils that have sandy underlying layers or a loamy subsoil; mainly on broad, dunelike uplands; 2 to 8 percent slopes
- 4 — PELHAM-LEEFIELD: Poorly drained and somewhat poorly drained soils that have a loamy subsoil; mainly on upland flats; 0 to 2 percent slopes
- 5 — OSIER-PELHAM: Poorly drained soils that have sandy underlying layers or a loamy subsoil; on flood plains and flats; 0 to 2 percent slopes

Compiled 1978

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATIONS

GENERAL SOIL MAP

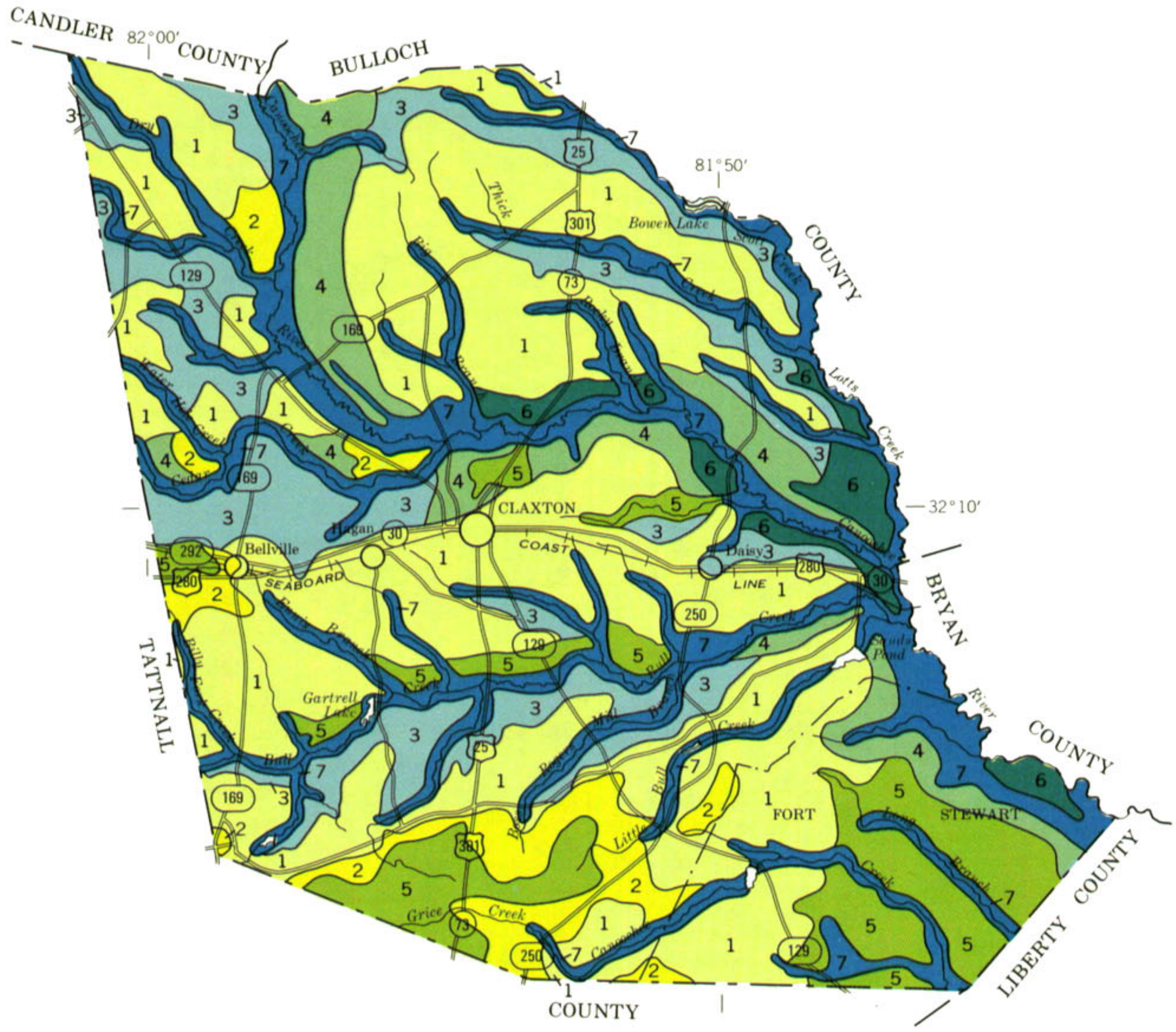
CANDLER COUNTY, GEORGIA

Scale 1:190,080

1 0 1 2 3 Miles

1 0 3 6 Km

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



LEGEND

1	TIFTON-FUQUAY-PELHAM: Well drained and poorly drained soils that have a loamy subsoil; on broad uplands and along drainageways; 0 to 8 percent slopes
2	LEEFIELD-IRVINGTON-PELHAM: Moderately well drained to poorly drained soils that have a loamy subsoil; on broad, low uplands and in depressions; 0 to 2 percent slopes
3	FUQUAY-BONIFAY-COWARTS: Well drained soils that have a loamy subsoil; on narrow ridgetops and short, irregular, convex hillsides; mostly 1 to 8 percent slopes
4	BONIFAY-KERSHAW: Well drained and excessively drained soils that have a loamy subsoil or sandy underlying layers; mainly on broad, dunelike uplands; 2 to 8 percent slopes
5	PELHAM-LEEFIELD: Poorly drained and somewhat poorly drained soils that have a loamy subsoil; mainly on upland flats; 0 to 2 percent slopes
6	BLADEN-CRAVEN: Poorly drained and moderately well drained soils that have a clayey subsoil; on terraces and broad plains that are adjacent to major streams; 0 to 2 percent slopes
7	OSIER-PELHAM: Poorly drained soils that have sandy underlying layers or a loamy subsoil; on flood plains and flats; 0 to 2 percent slopes

Compiled 1978

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATIONS

GENERAL SOIL MAP

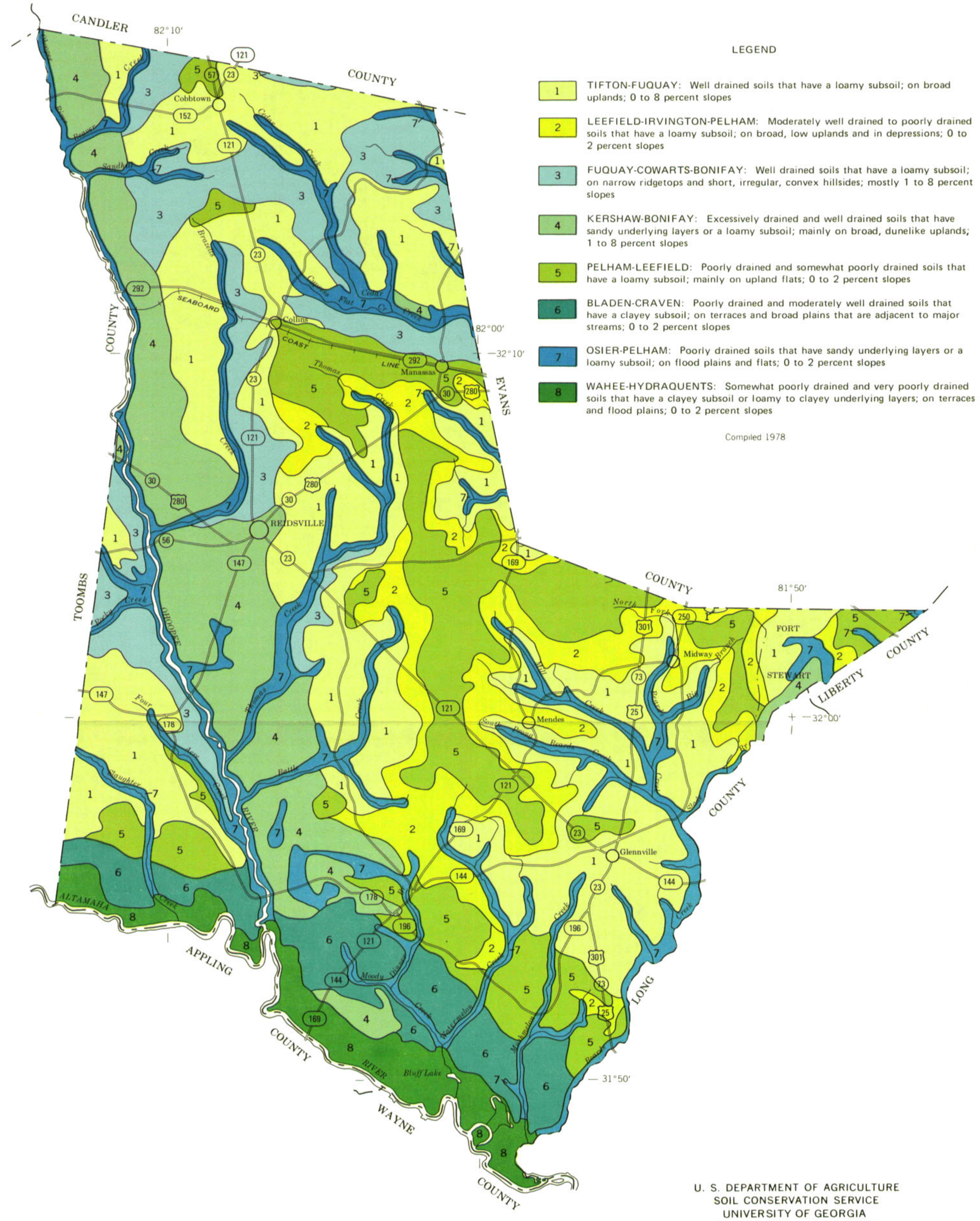
EVANS COUNTY, GEORGIA

Scale 1:190,080

1 0 1 2 3 Miles

1 0 3 6 Km

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATIONS

GENERAL SOIL MAP

TATTNALL COUNTY, GEORGIA

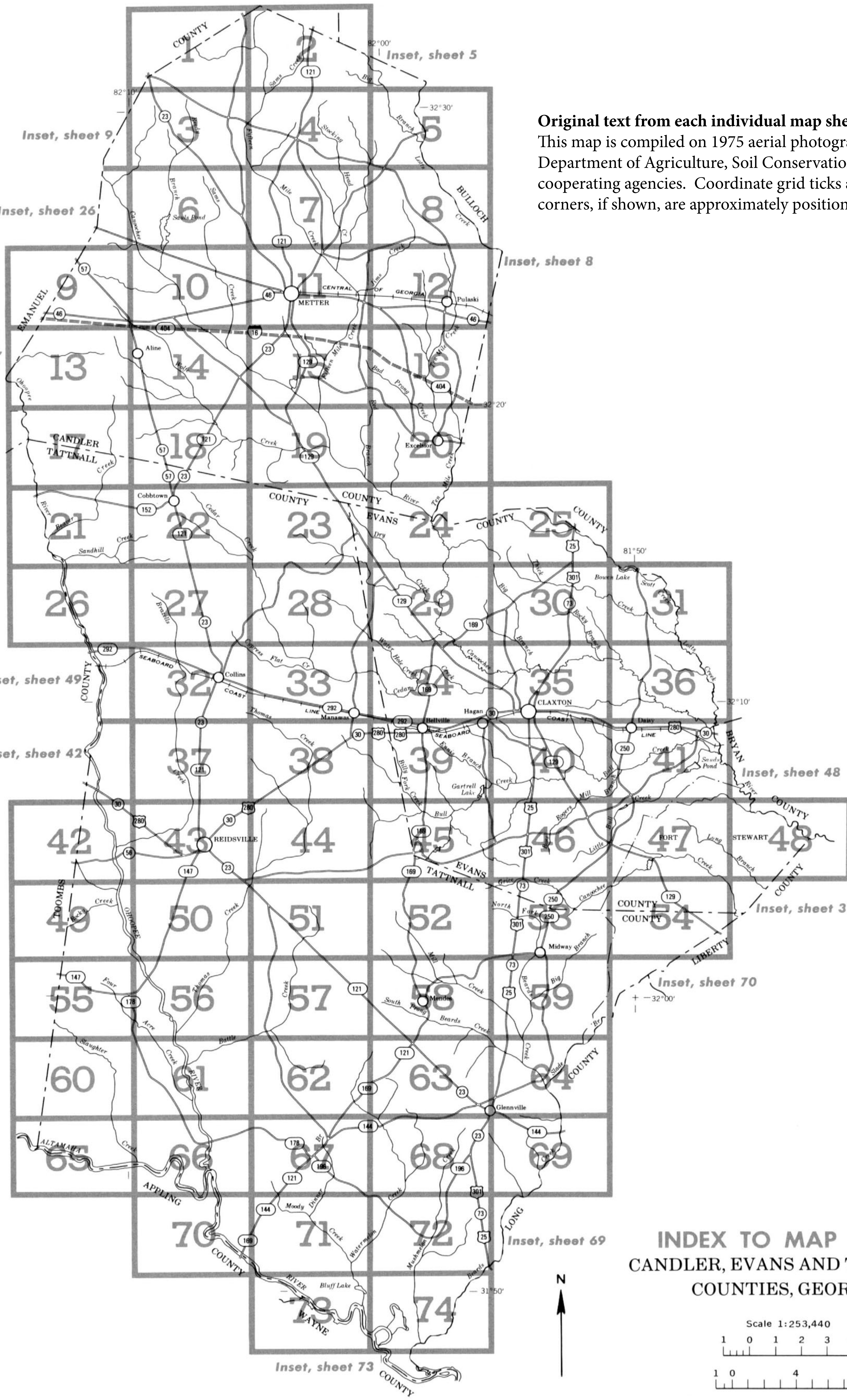
Scale 1:190,080

1 0 1 2 3 Miles

1 0 3 6 Km

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

Original text from each individual map sheet read:
This map is compiled on 1975 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



INDEX TO MAP SHEETS

CANDLER, EVANS AND TATTNALL COUNTIES, GEORGIA

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km

SOIL LEGEND

The first letter, always a capital, is the initial letter of the soil name. The second letter is a capital, if the mapping unit is broadly defined 1/; otherwise, it is a small letter. The third letter, if used, is a capital letter and connotes slope class. Symbols without a slope letter are for level soils. A final number 2 in the symbol shows the soil is eroded.

SYMBOL	NAME
AdA	Albany sand, 0 to 2 percent slopes
Bk	Bladen fine sandy loam
BoC	Bonifay fine sand, 1 to 8 percent slopes
BoD	Bonifay fine sand, 8 to 12 percent slopes
CaC2	Carnegie sandy loam, 5 to 8 percent slopes, eroded
CaD2	Carnegie sandy loam, 8 to 12 percent slopes, eroded
CoB	Cowarts loamy sand, 2 to 5 percent slopes
CoC	Cowarts loamy sand, 5 to 8 percent slopes
CrA	Craven fine sandy loam, 0 to 1 percent slopes
DoA	Dothan loamy sand, 0 to 2 percent slopes
DoB	Dothan loamy sand, 2 to 5 percent slopes
Em	Ellabelle loamy sand
FsB	Fuquay loamy sand, 1 to 5 percent slopes
FsC	Fuquay loamy sand, 5 to 8 percent slopes
Hz	Hydraquents
IgA	Irvington loamy sand, 0 to 2 percent slopes
KeC	Kershaw sand, 2 to 8 percent slopes
KuD	Kureb sand, 5 to 12 percent slopes
Le	Leefield loamy sand
OS	Osier soils
Pe	Pelham loamy sand
Ru	Rutlege sand
Se	Stilson loamy sand
TfA	Tifton loamy sand, 0 to 2 percent slopes
TfB	Tifton loamy sand, 2 to 5 percent slopes
TsC2	Tifton sandy loam, 5 to 8 percent slopes, eroded
WA	Wahee association

1/ Consecutive capital letters in the map symbol indicate the delineations generally are much larger and the composition of the unit is more variable than for others in the survey area. Mapping has been controlled well enough to be interpreted for the anticipated uses of the soils.

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool — Davis Airstrip; FLOOD POOL LINE

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS

- Interstate — 79
- Federal — 410
- State — 52
- County, farm or ranch — 378

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small — water; w

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — GAS
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water; w
- Intermittent — int; i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — CeA FoB2

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

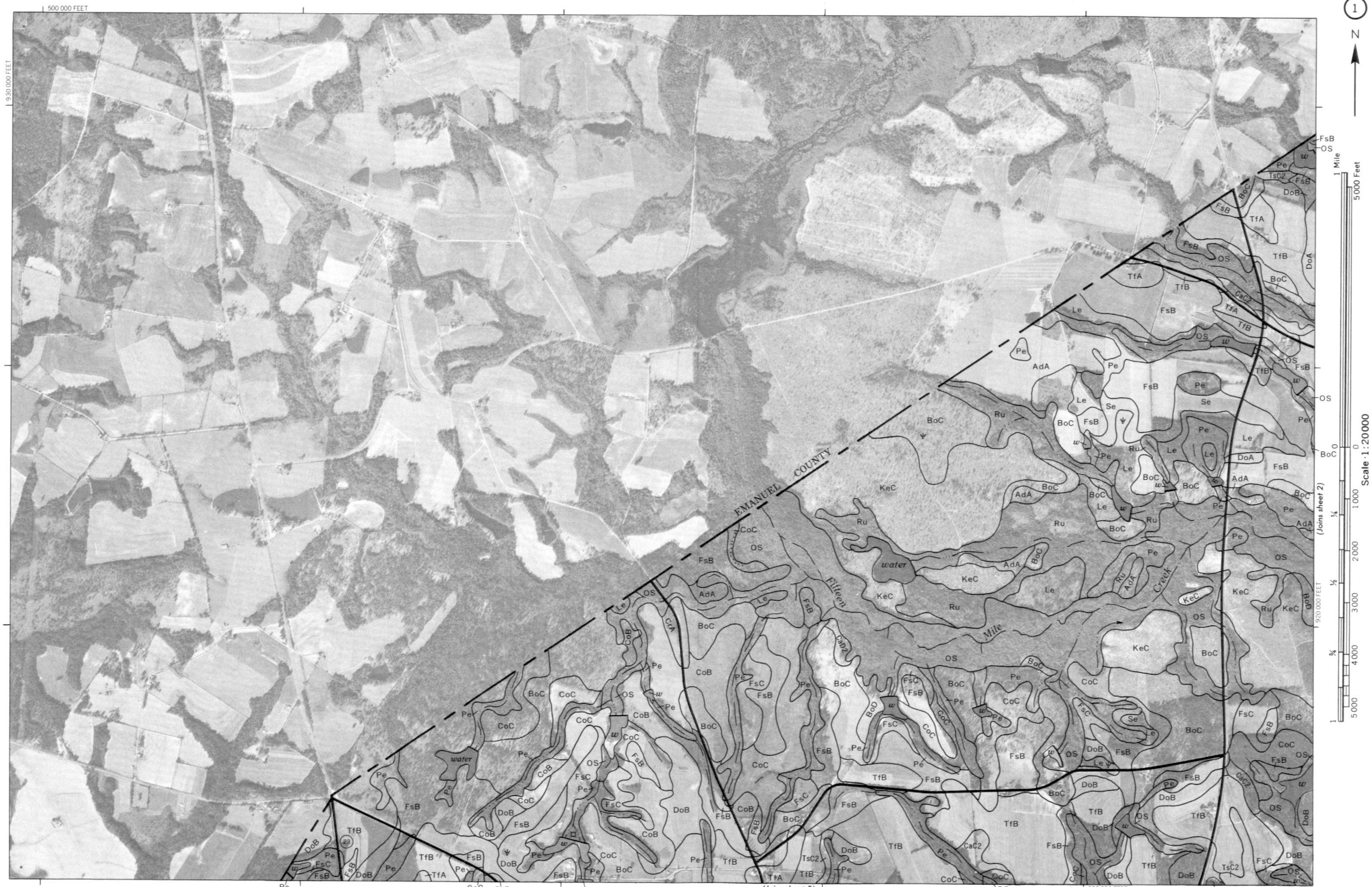
GULLY

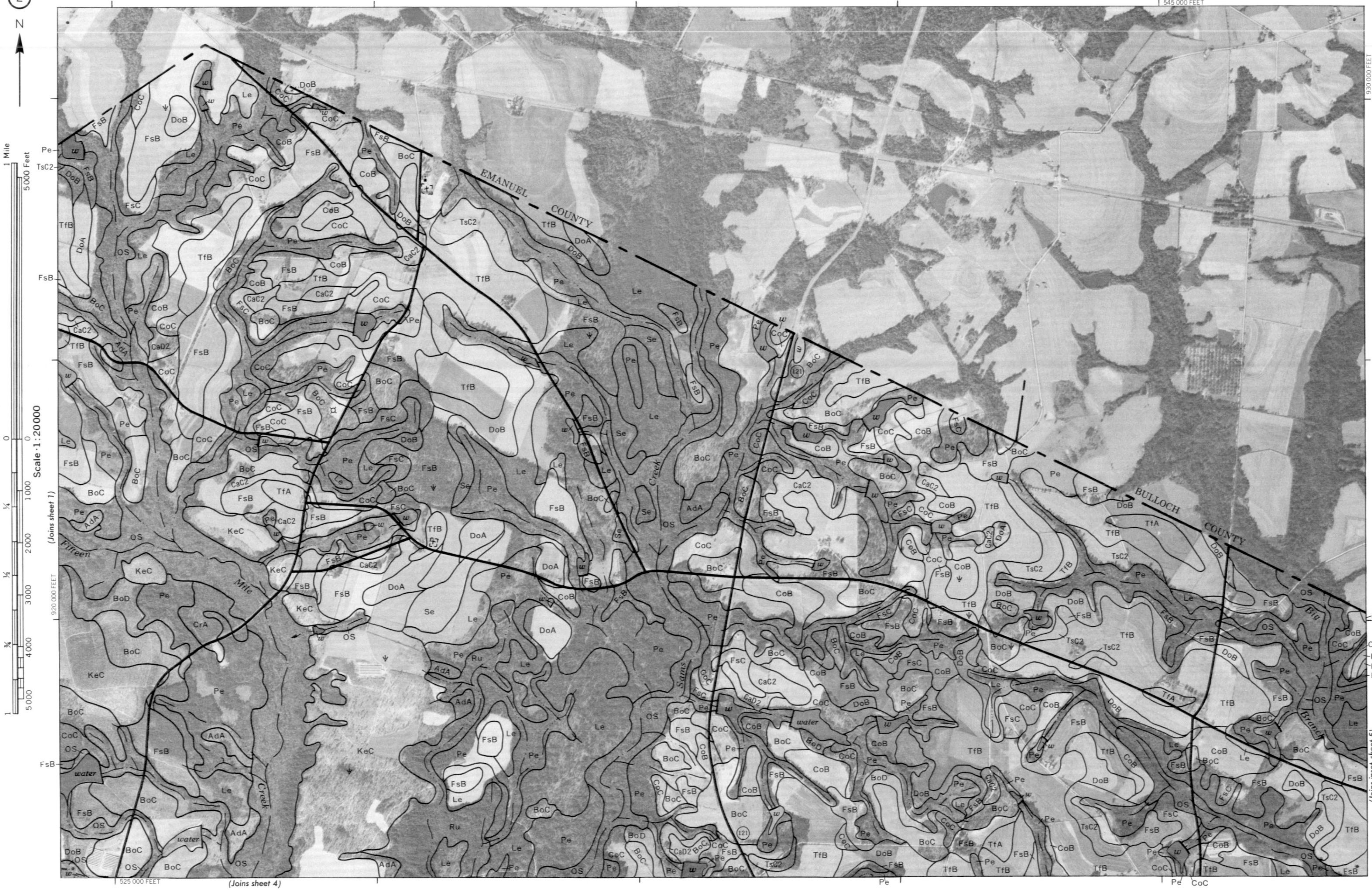
DEPRESSION OR SINK

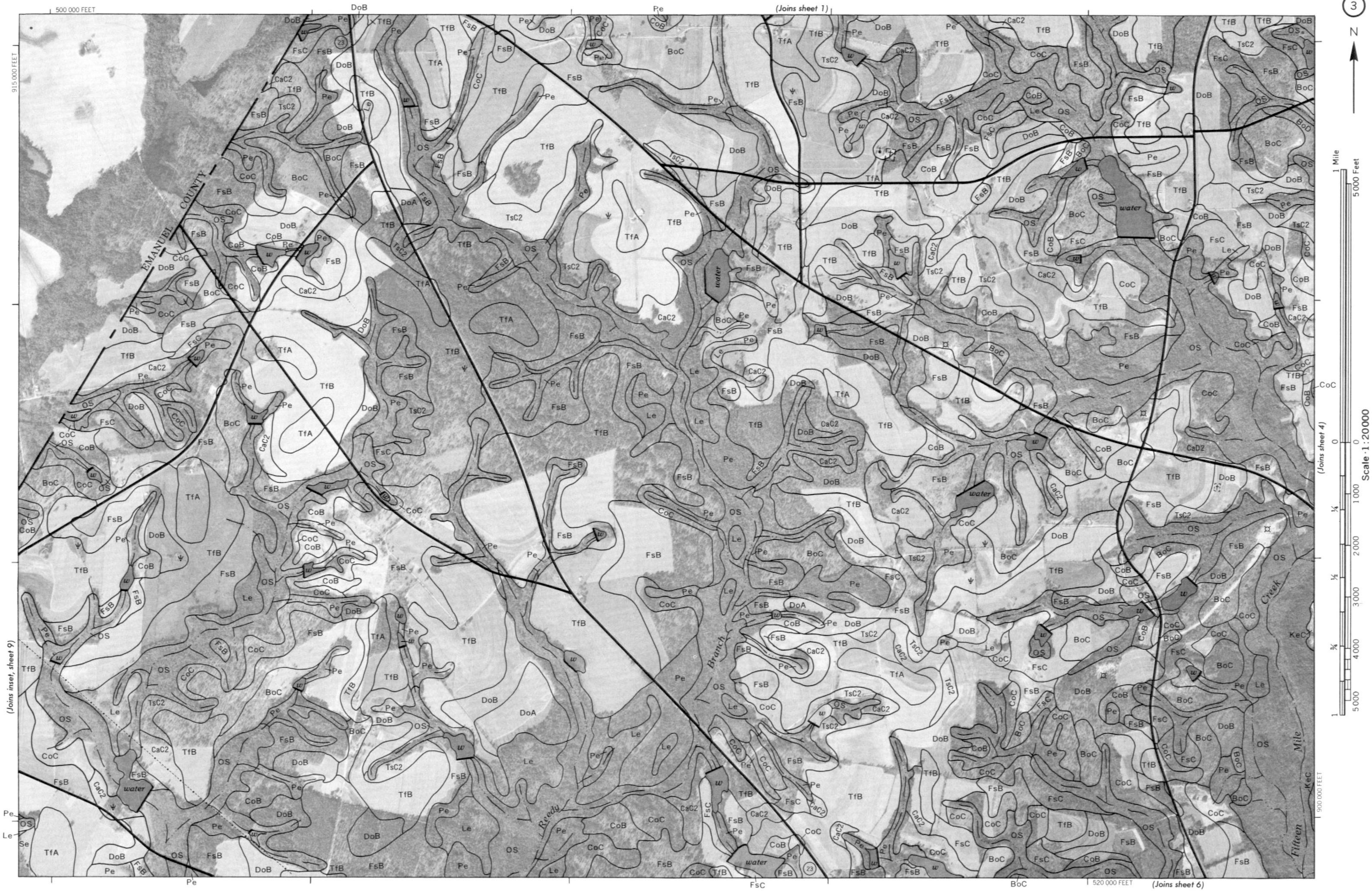
SOIL SAMPLE SITE (normally not shown) — S

MISCELLANEOUS

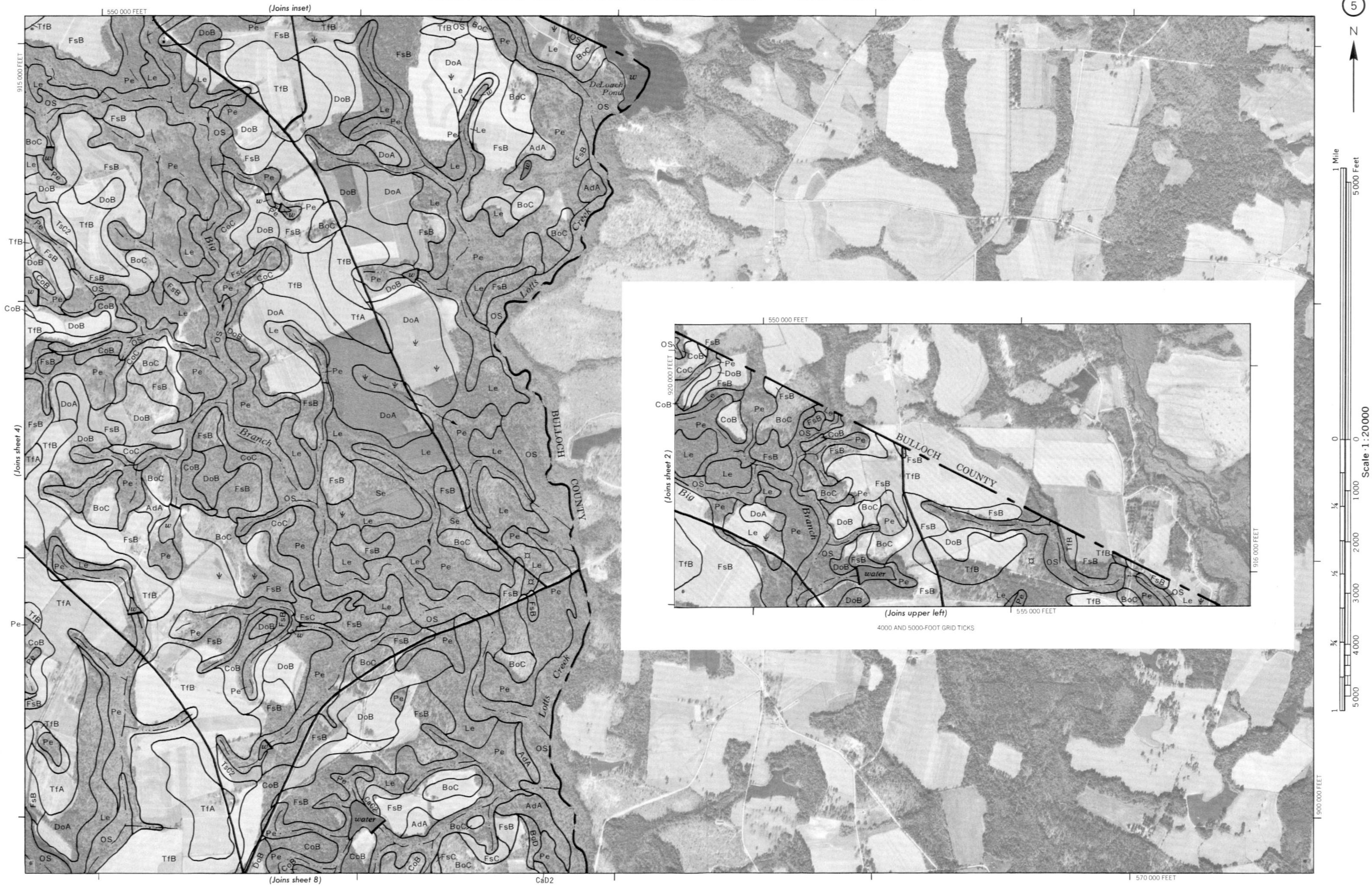
- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Borrow Pit
- Pipeline pumpstation
- Power substation

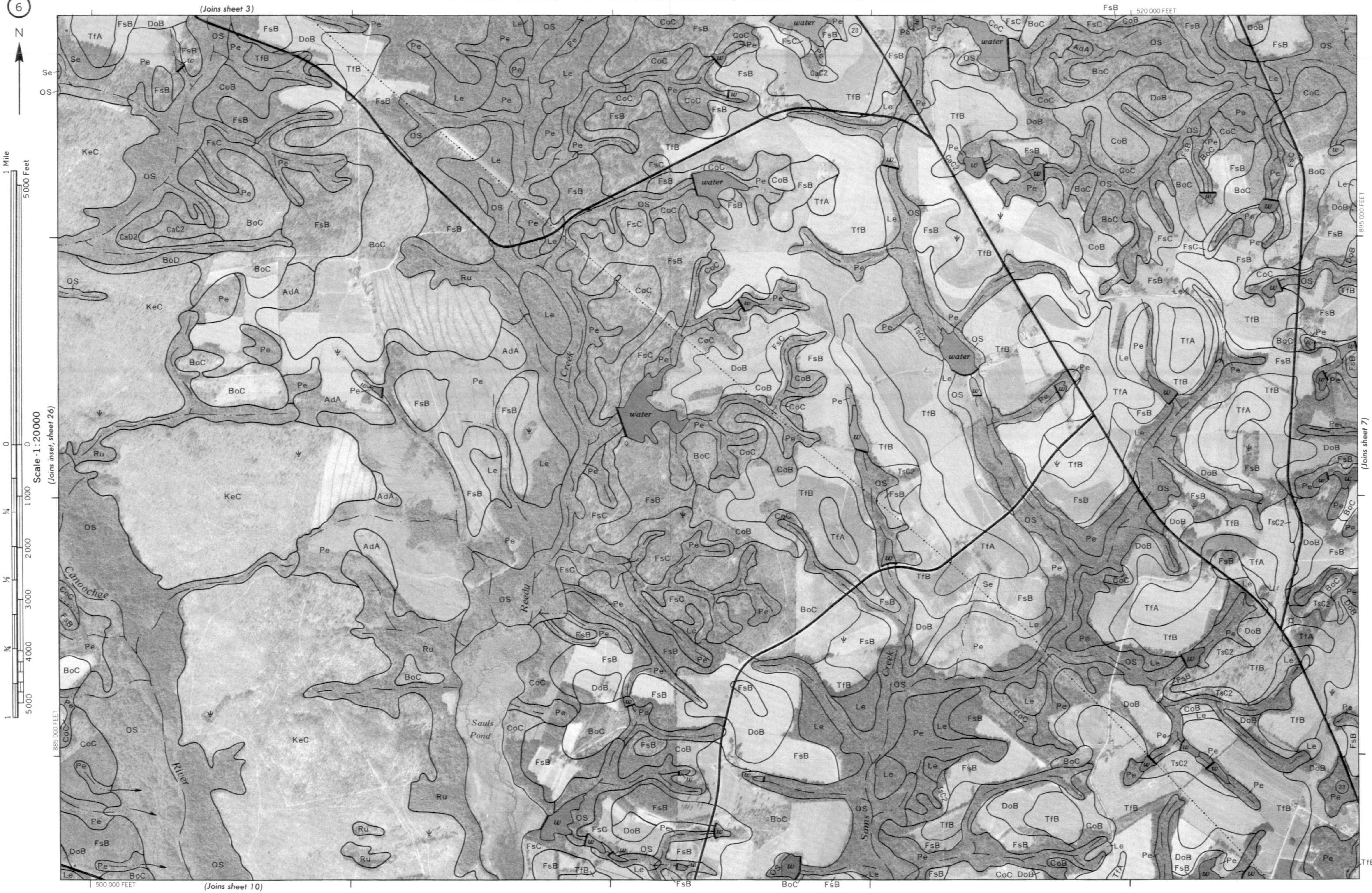

1
N
500 000 FEET
930 000 FEET
920 000 FEET
520 000 FEET
EMANUEL COUNTY
Fifteen Mile Creek
water
(Joins sheet 2)
(Joins sheet 3)
1 Mile
5000 Feet
Scale 1:20000

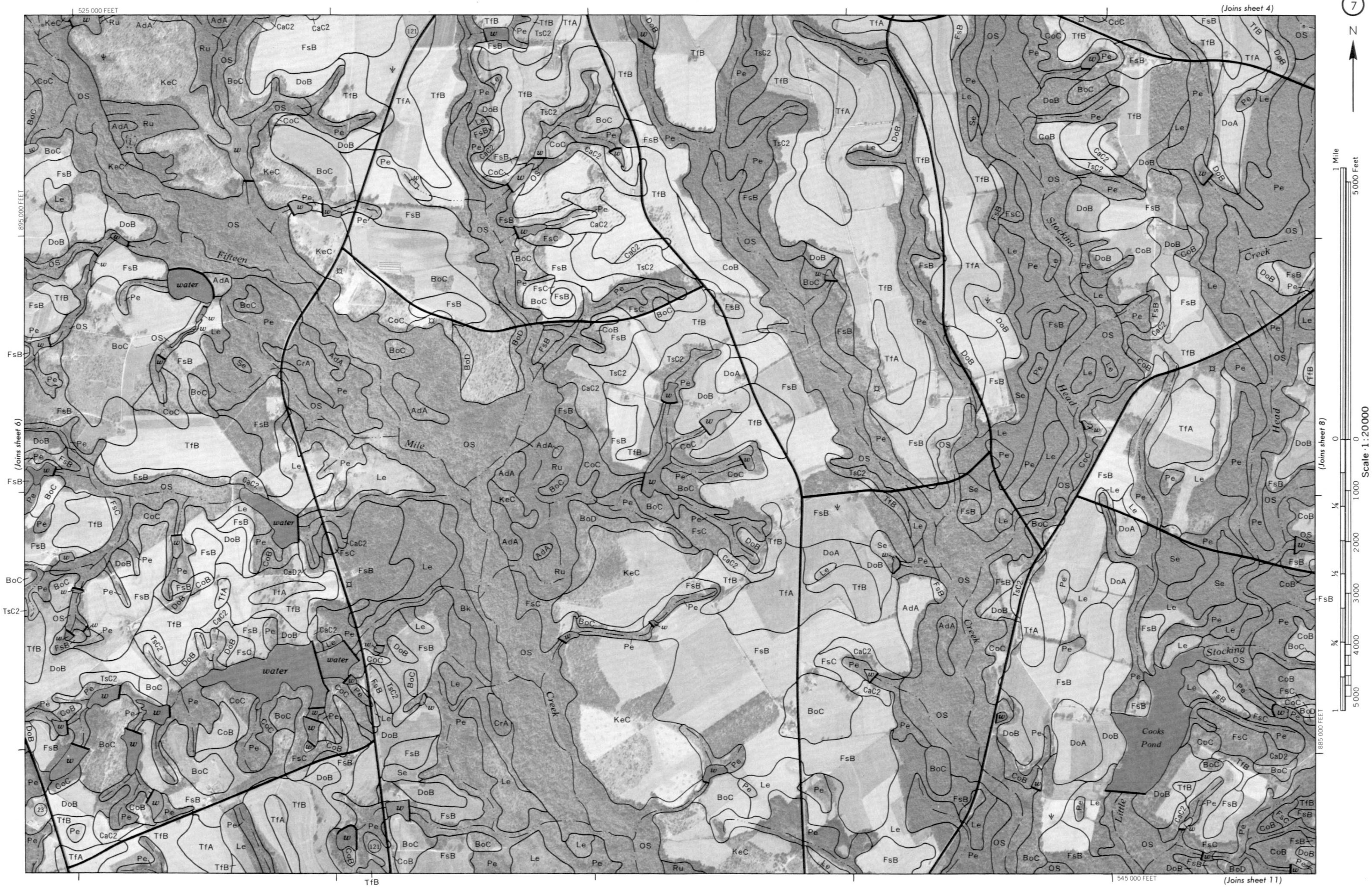

2
N
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
(Joins sheet 1)
(Joins sheet 4)
(Joins inset, sheet 5)
545 000 FEET
930 000 FEET
920 000 FEET
525 000 FEET
EMANUEL COUNTY
BULLOCH COUNTY
Fifteen Mile Creek
Sams Creek
Big Branch
water
121


3
N
(Joins sheet 1)
(Joins sheet 4)
(Joins sheet 6)
(Joins inset, sheet 9)
500 000 FEET
520 000 FEET
915 000 FEET
900 000 FEET
EMANUEL COUNTY
Reedy Branch
Fifteen Mile Creek
water
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
¼
½
¾
1

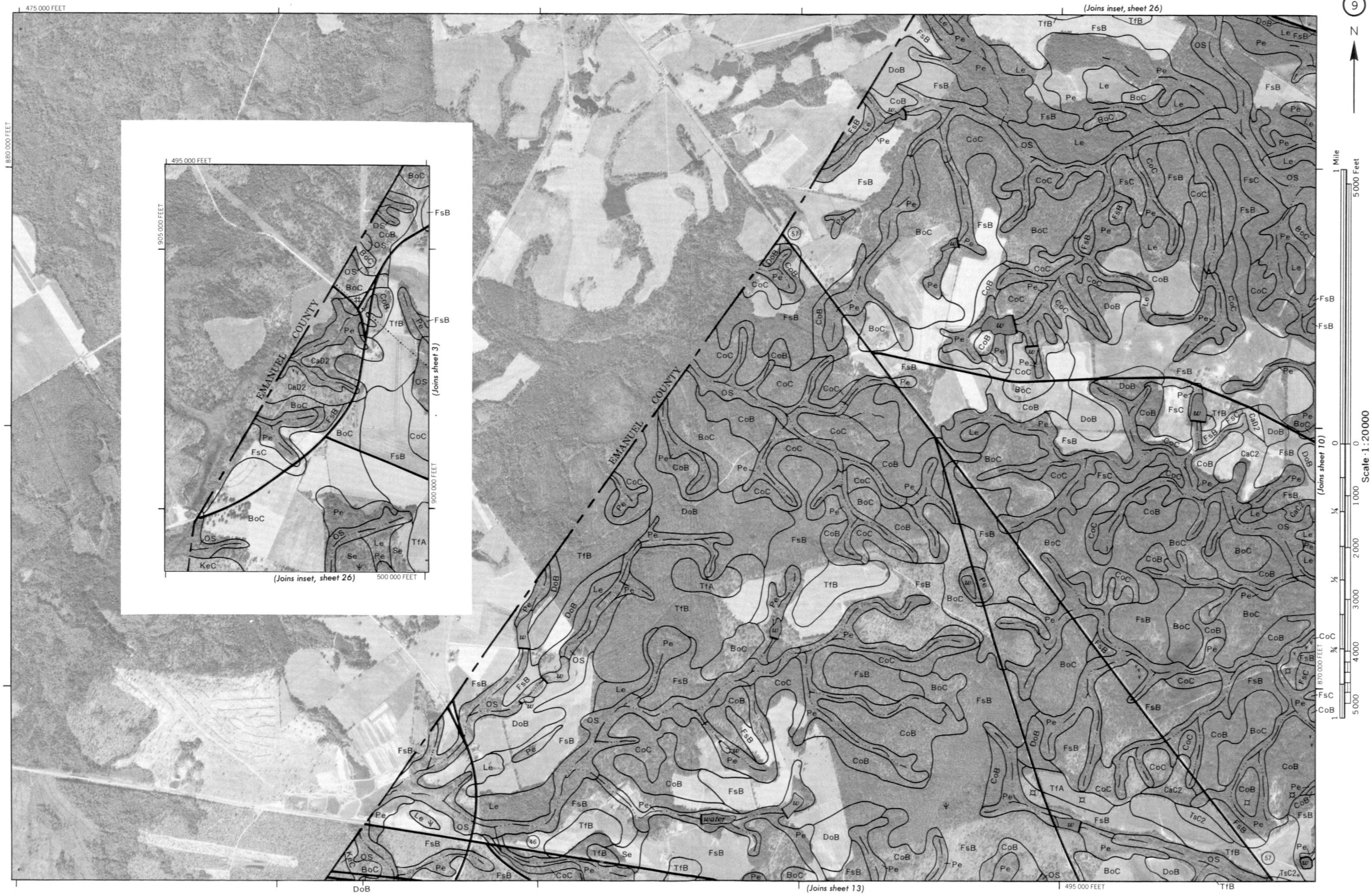

4
N
(Joins sheet 2)
(Joins sheet 3)
(Joins sheet 5)
(Joins sheet 7)
Scale 1:20000
1 Mile
5000 Feet
545 000 FEET
525 000 FEET
915 000 FEET
900 000 FEET
Sams Creek
Fifteen Mile Creek
Stocking Head Creek
Little Stocking Head Creek
water
121

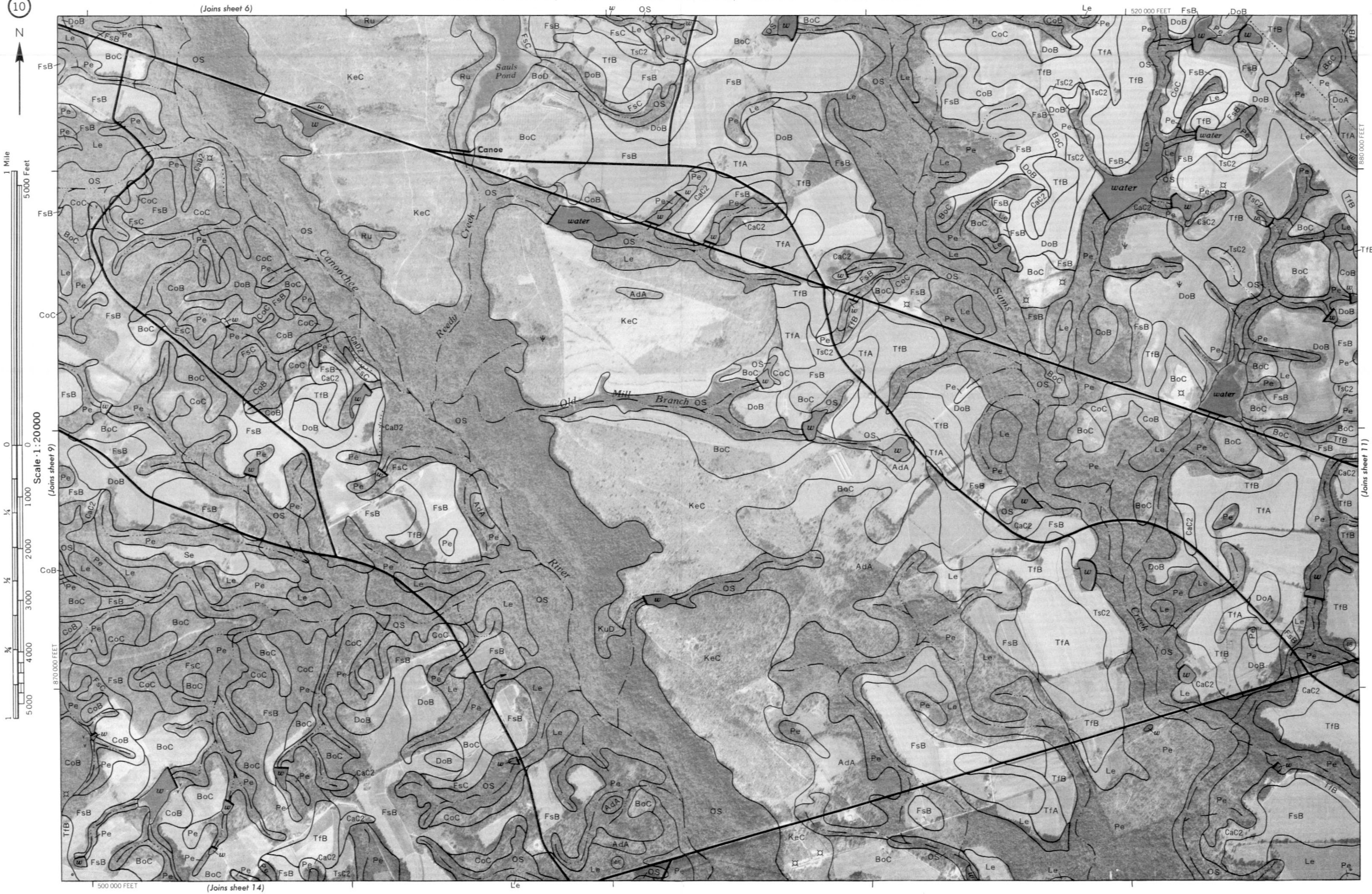

5
N
(Joins inset)
550 000 FEET
915 000 FEET
DeLoach Pond
Big Branch
Lotts Creek
BULLOCH COUNTY
(Joins sheet 4)
(Joins sheet 8)
CaD2
570 000 FEET
900 000 FEET
550 000 FEET
920 000 FEET
916 000 FEET
555 000 FEET
(Joins sheet 2)
(Joins upper left)
4000 AND 5000-FOOT GRID TICKS
water
1 Mile
5000 Feet
Scale 1:20000


6
N
(Joins sheet 3)
(Joins sheet 10)
(Joins sheet 7)
(Joins inset, sheet 26)
Scale 1:20000
1 Mile
5000 Feet
520 000 FEET
500 000 FEET
895 000 FEET
885 000 FEET
Canoochee
River
Reedy
Creek
Sauls
Pond
Sams
Creek
water


7
N
(Joins sheet 4)
(Joins sheet 6)
(Joins sheet 8)
(Joins sheet 11)
525 000 FEET
895 000 FEET
885 000 FEET
545 000 FEET
Fifteen
Mile
Creek
Stocking
Head
Creek
Little
Cooks
Pond
water
1 Mile
5000 Feet
Scale 1:20000

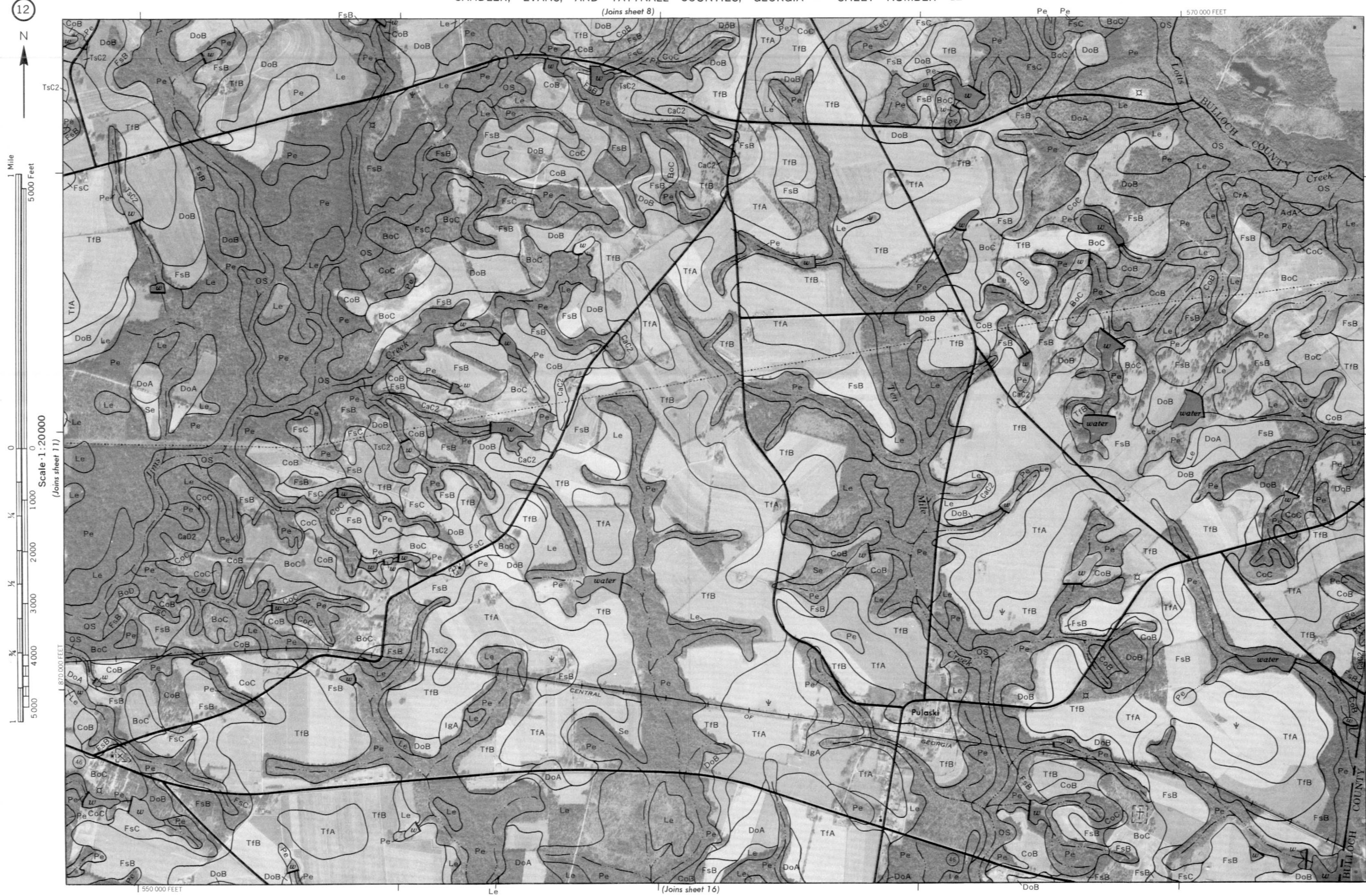

8
N
(Joins sheet 5)
(Joins sheet 7)
(Joins sheet 12)
(Joins sheet 12)
Scale 1:20000
1 Mile
5000 Feet
570 000 FEET
575 000 FEET
574 000 FEET
550 000 FEET
880 000 FEET
895 000 FEET
870 000 FEET
885 000 FEET
Turner Airport (Pvt)
Stocking Head Creek
Little
Lotts Creek
Lott Creek
BULLOCH COUNTY
water
1000 AND 5000-FOOT GRID TICKS


9
N
475 000 FEET
880 000 FEET
870 000 FEET
495 000 FEET
(Joins inset, sheet 26)
(Joins sheet 10)
(Joins sheet 13)
EMANUEL COUNTY
495 000 FEET
905 000 FEET
900 000 FEET
500 000 FEET
(Joins sheet 3)
(Joins inset, sheet 26)
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
¼
½
¾
water

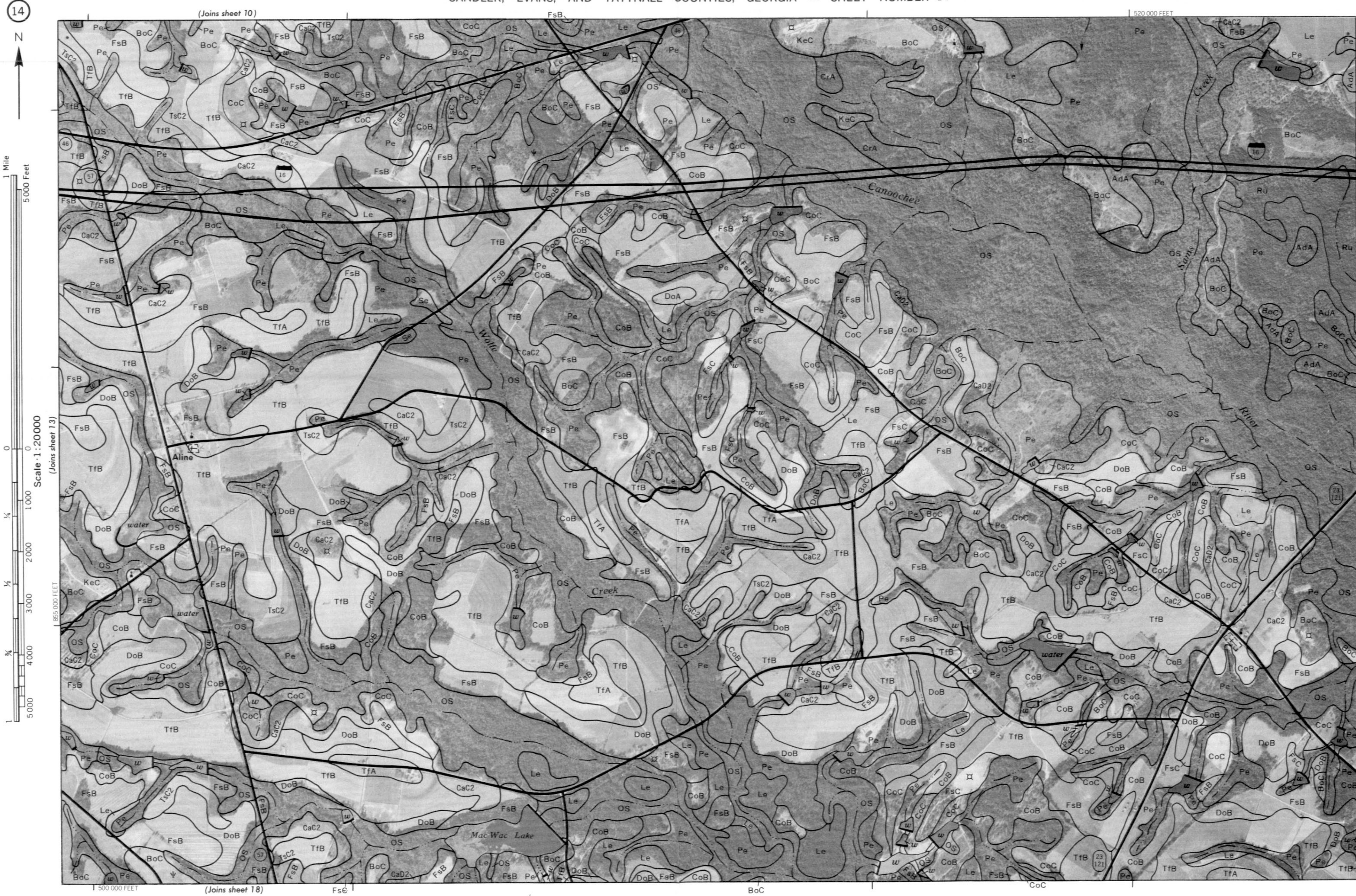


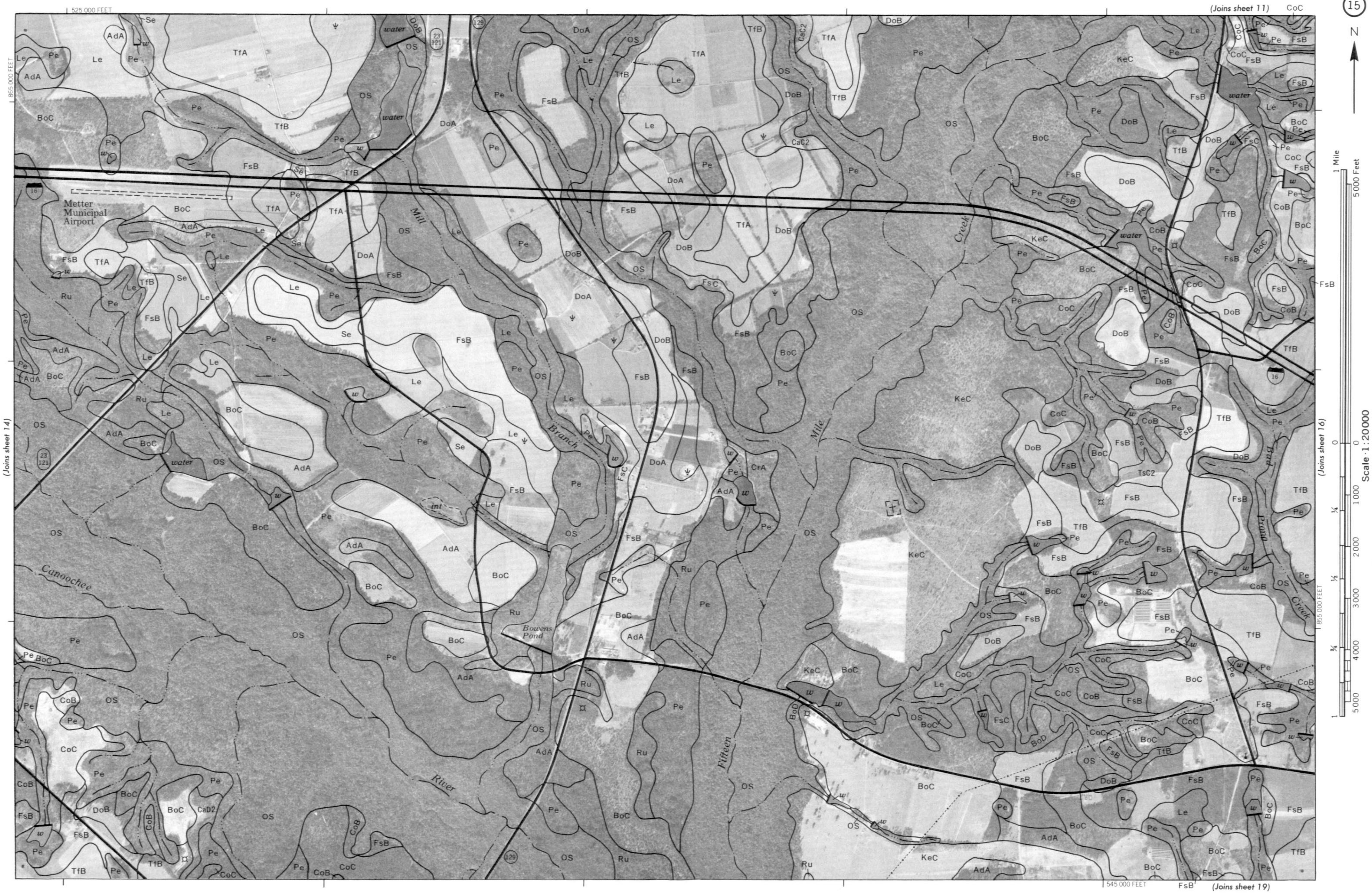
N
(Joins sheet 6)
(Joins sheet 9)
(Joins sheet 11)
(Joins sheet 14)
Scale 1:20000
1 Mile
5000 Feet
520 000 FEET
880 000 FEET
870 000 FEET
500 000 FEET
Sauls Pond
Canoe
Canoochee River
Reedy Creek
Old Mill Branch
Sams Creek
water

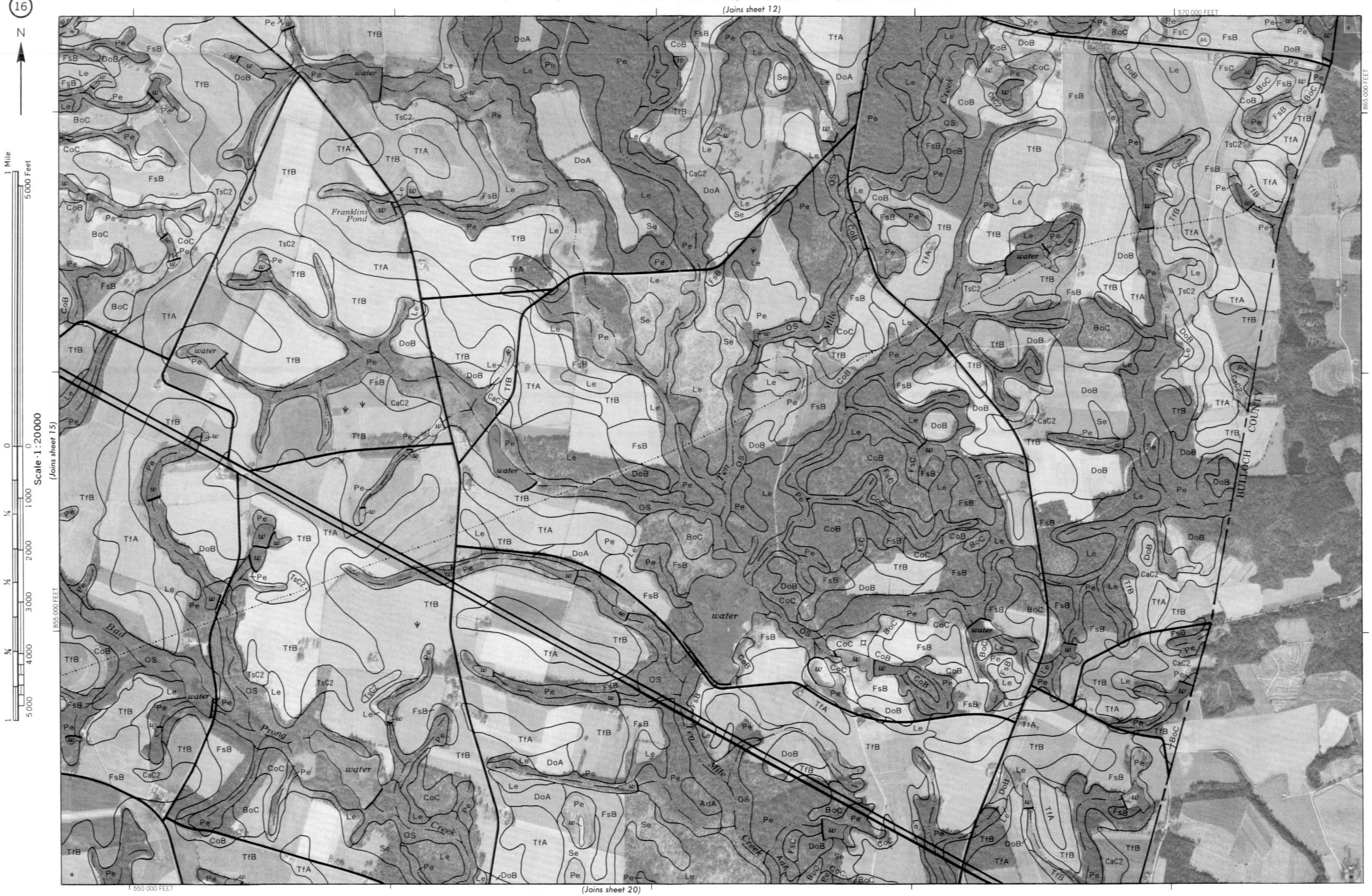

11
N
(Joins sheet 7)
(Joins sheet 10)
(Joins sheet 12)
(Joins sheet 15)
525 000 FEET
545 000 FEET
880 000 FEET
870 000 FEET
METTER
(county seat)
CENTRAL
OF
GEORGIA
Fifteen
Mile
Creek
Stocking
Head
Creek
Little Stocking Head Cr
Jims
Creek
Mill
Branch
intermittent
water
1 Mile
5000 Feet
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
Scale 1:20000

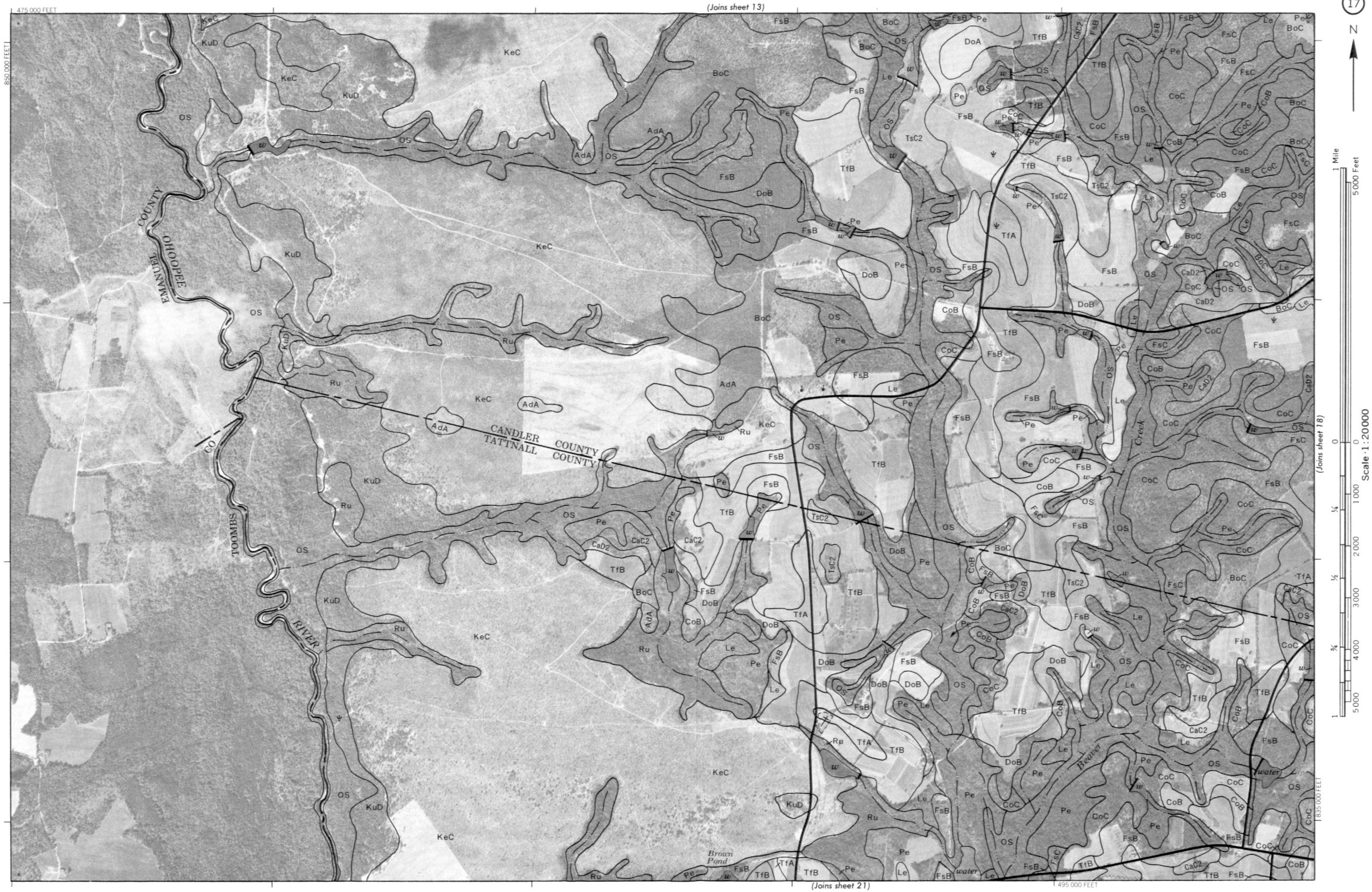

N
1 Mile
5000 Feet
0
1000
2000
3000
4000
5000
Scale 1:20000
(Joins sheet 8)
(Joins sheet 11)
(Joins sheet 16)
(Joins inset, sheet 8)
570 000 FEET
880 000 FEET
870 000 FEET
550 000 FEET
BULLOCH COUNTY
Lotts Creek
Jims Creek
Ten Mile Creek
Pulaski
CENTRAL OF GEORGIA
46
water
TfA
TfB
DoB
DoA
CoB
CoC
FsB
FsC
BoC
BoD
Pe
Le
OS
Se
IgA
CaC2
TsC2
AdA
CrA
w

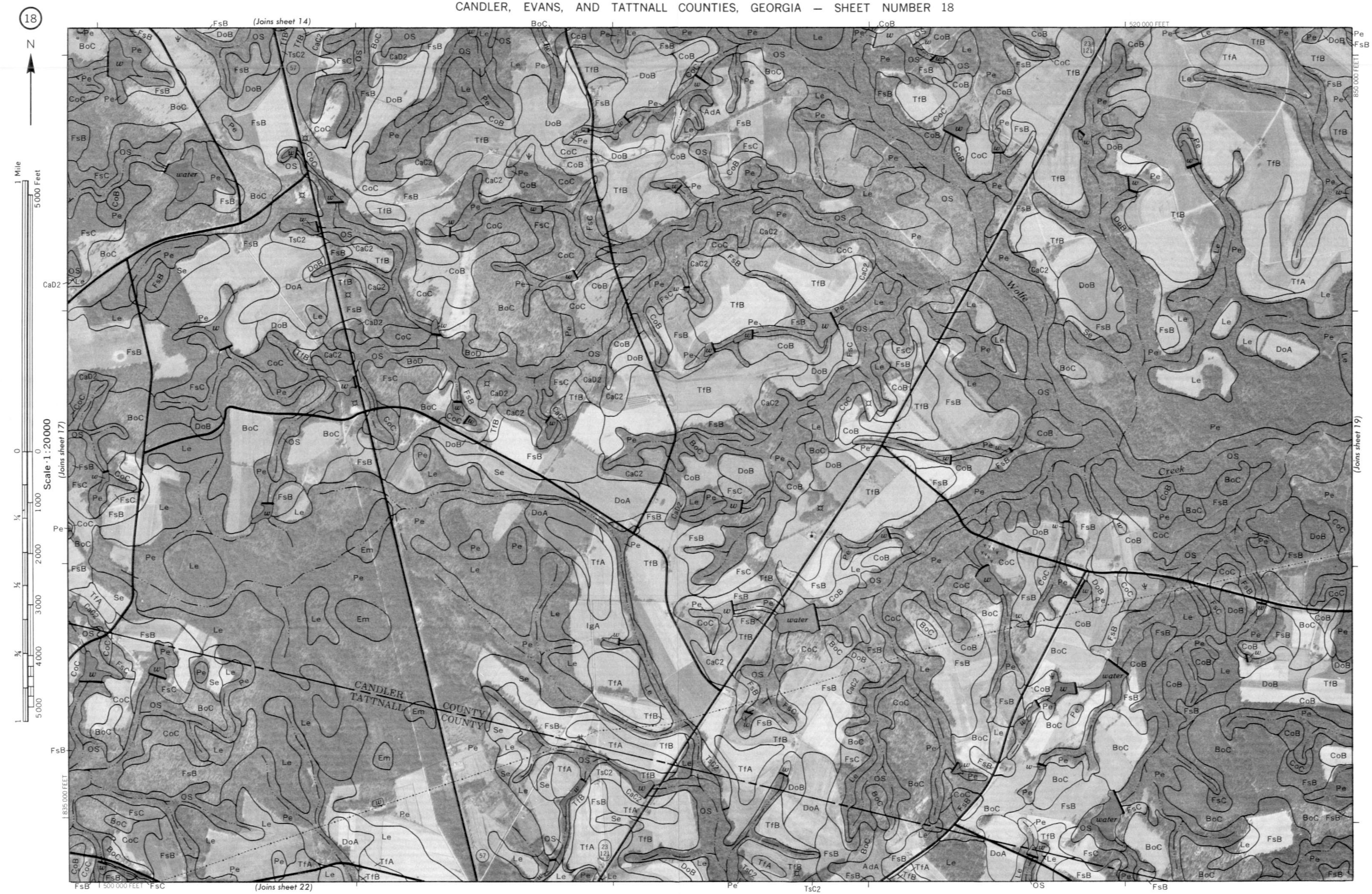

(Joins sheet 9)
(Joins sheet 14)
(Joins sheet 17)
(Joins inset, sheet 21)
475 000 FEET
495 000 FEET
865 000 FEET
855 000 FEET
13
N
EMANUEL COUNTY
OHOOPEE RIVER
EMANUEL COUNTY
water
1 Mile
5 000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000

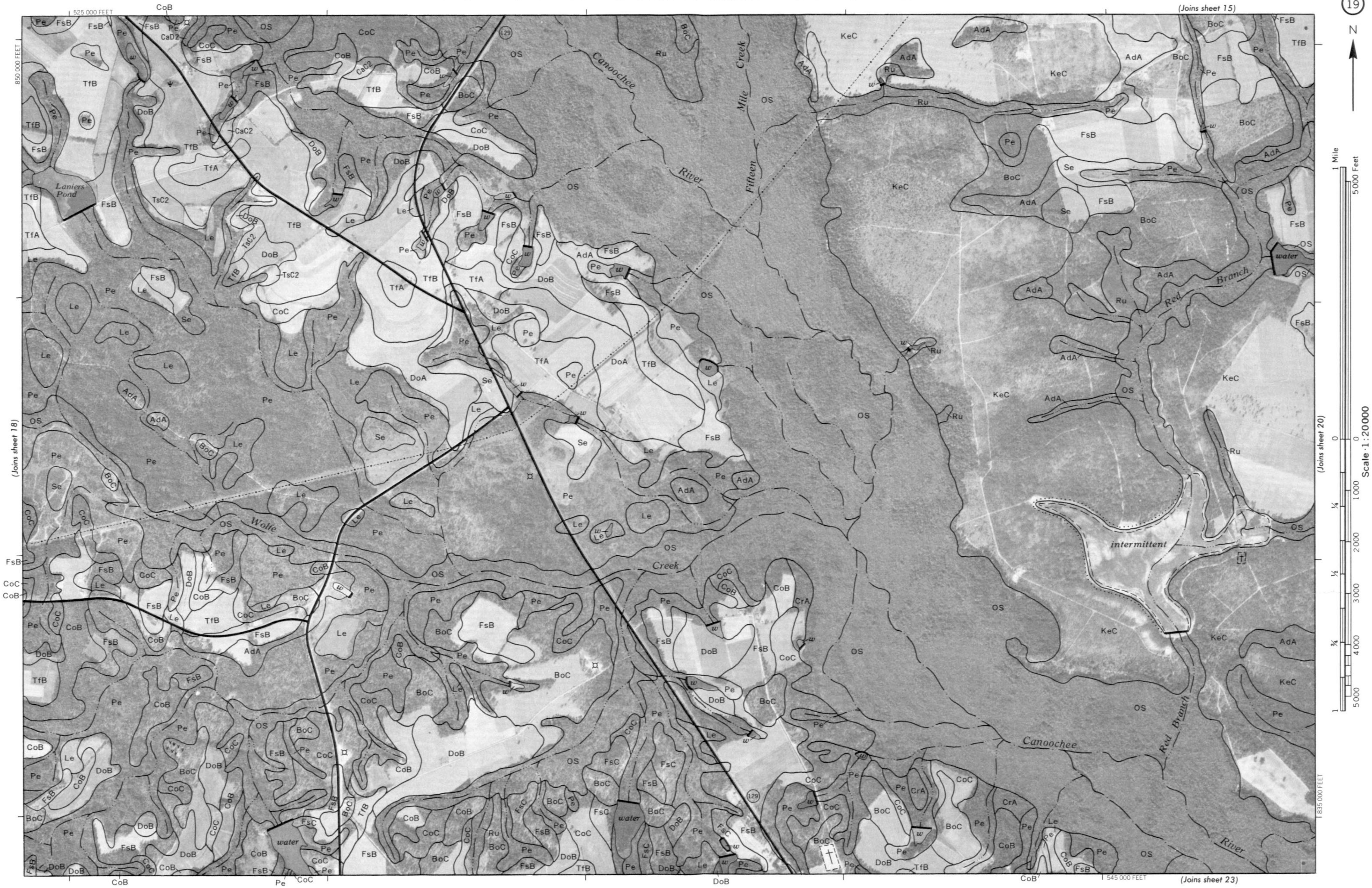

14
N
(Joins sheet 10)
(Joins sheet 13)
(Joins sheet 15)
(Joins sheet 18)
520 000 FEET
500 000 FEET
855 000 FEET
865 000 FEET
Aline
Canoochee River
Wolfe Creek
Sams Creek
Mac Wac Lake
water
Scale 1:20000
1 Mile
5000 Feet
0
1000
2000
3000
4000
5000

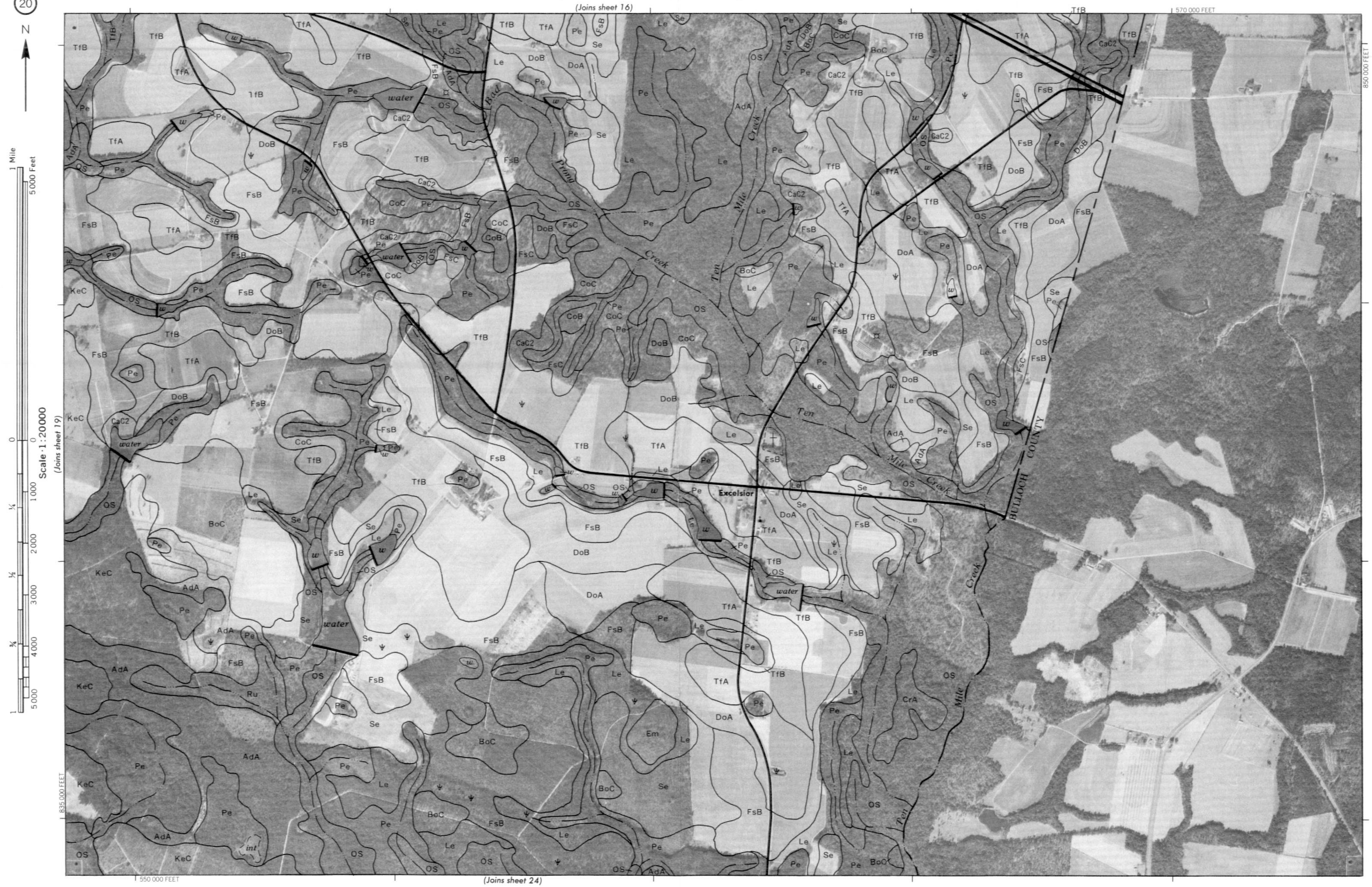

15
N
(Joins sheet 11)
(Joins sheet 14)
(Joins sheet 16)
(Joins sheet 19)
525 000 FEET
545 000 FEET
865 000 FEET
Metter
Municipal
Airport
Canoochee
River
Mill
Branch
Fifteen
Mile
Creek
Bowens
Pond
Pond
Creek
Scale 1:20000
1 Mile
5000 Feet

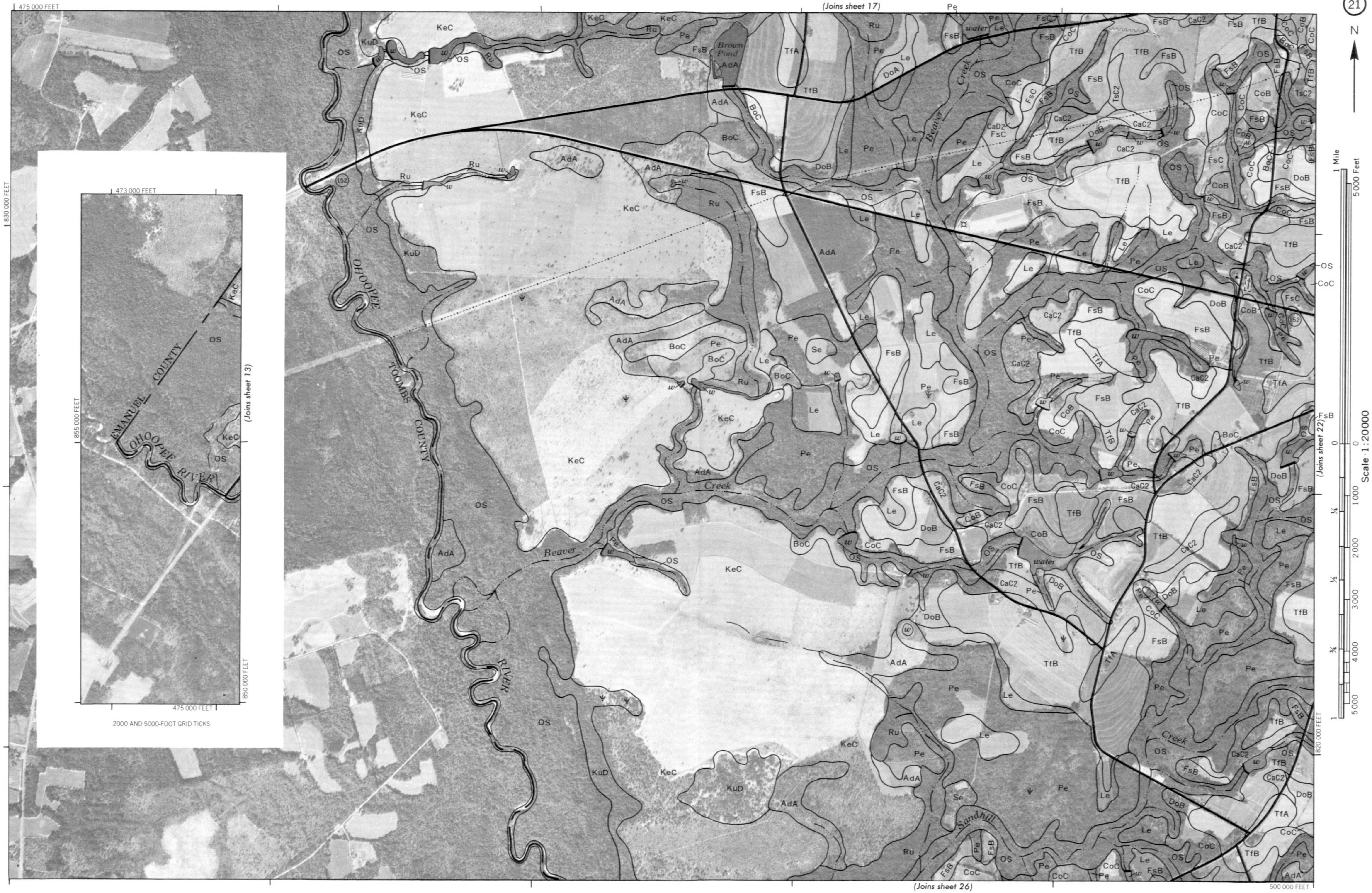

(Joins sheet 12)
(Joins sheet 15)
(Joins sheet 20)
N
1 Mile
5000 Feet
Scale 1:20000
570 000 FEET
865 000 FEET
855 000 FEET
550 000 FEET
Franklins Pond
Bad Prong Creek
Ten Mile Creek
BULLOCH COUNTY
water


17
N
(Joins sheet 13)
(Joins sheet 18)
(Joins sheet 21)
475 000 FEET
850 000 FEET
495 000 FEET
835 000 FEET
EMANUEL COUNTY
OHOOPEE
TOOMBS
RIVER
CO
CANDLER COUNTY
TATTNALL COUNTY
Beaver
Creek
Brown Pond
water
1 Mile
5 000 Feet
Scale 1:20000

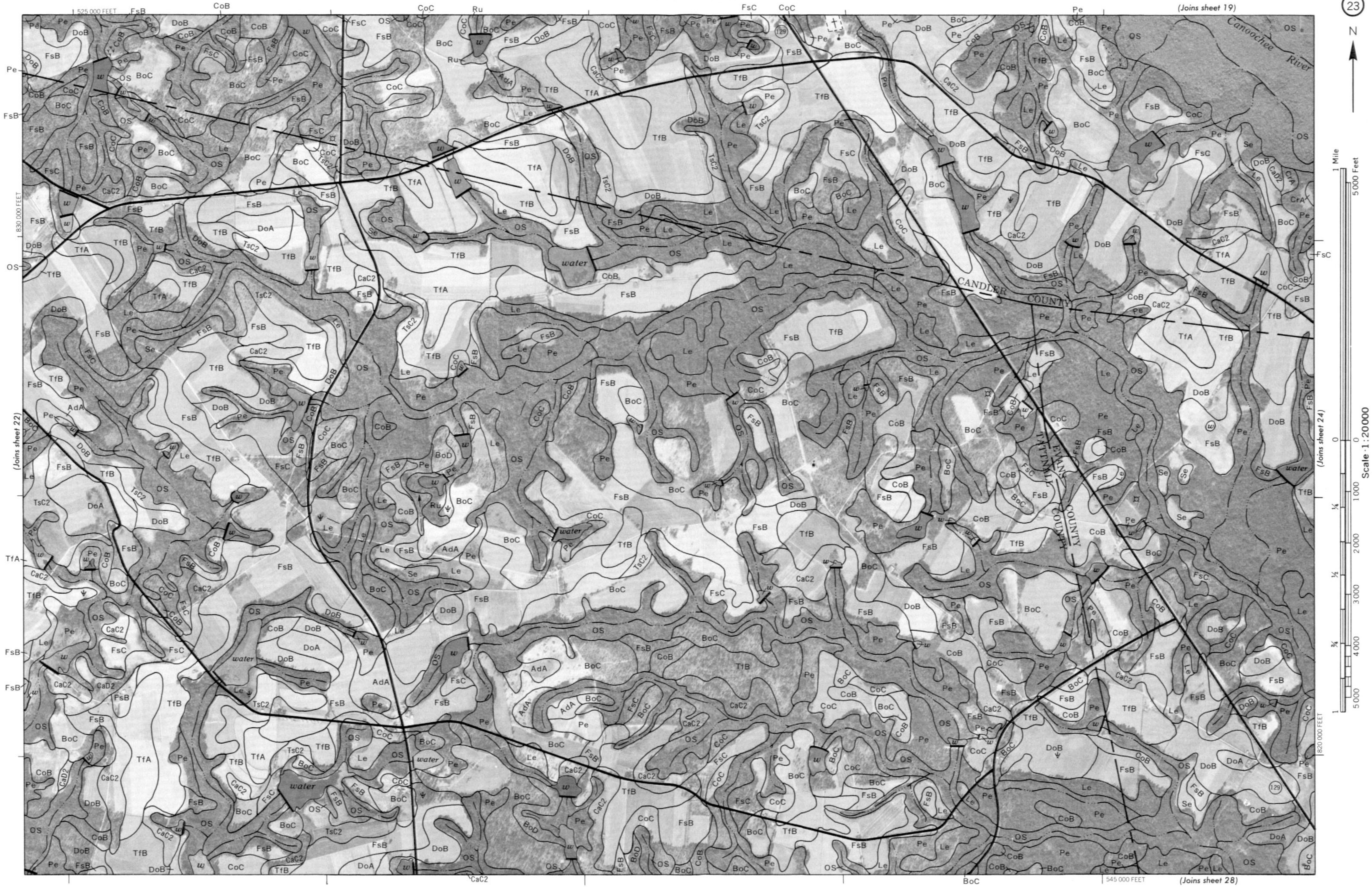

18
N
(Joins sheet 14)
(Joins sheet 22)
(Joins sheet 17)
(Joins sheet 19)
520 000 FEET
850 000 FEET
835 000 FEET
500 000 FEET
Scale 1:20000
1 Mile
5000 Feet
Wolfe
Creek
CANDLER COUNTY
TATTNALL COUNTY

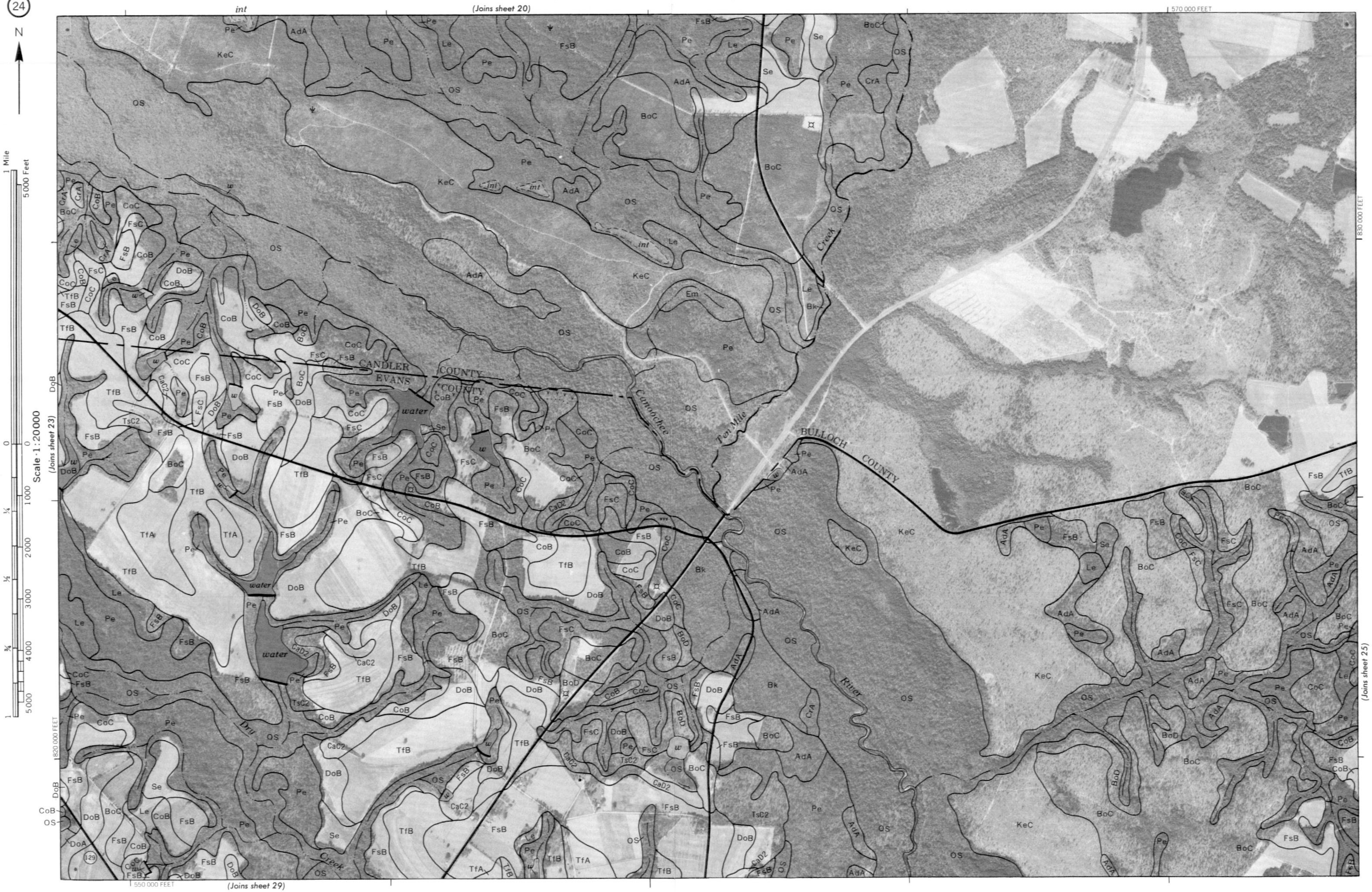

19
N
(Joins sheet 15)
(Joins sheet 18)
(Joins sheet 20)
(Joins sheet 23)
525 000 FEET
545 000 FEET
850 000 FEET
835 000 FEET
Laniers Pond
Canoochee River
Fifteen Mile Creek
Wolfe Creek
Red Branch
intermittent
water
1 Mile
5000 Feet
Scale 1:20000

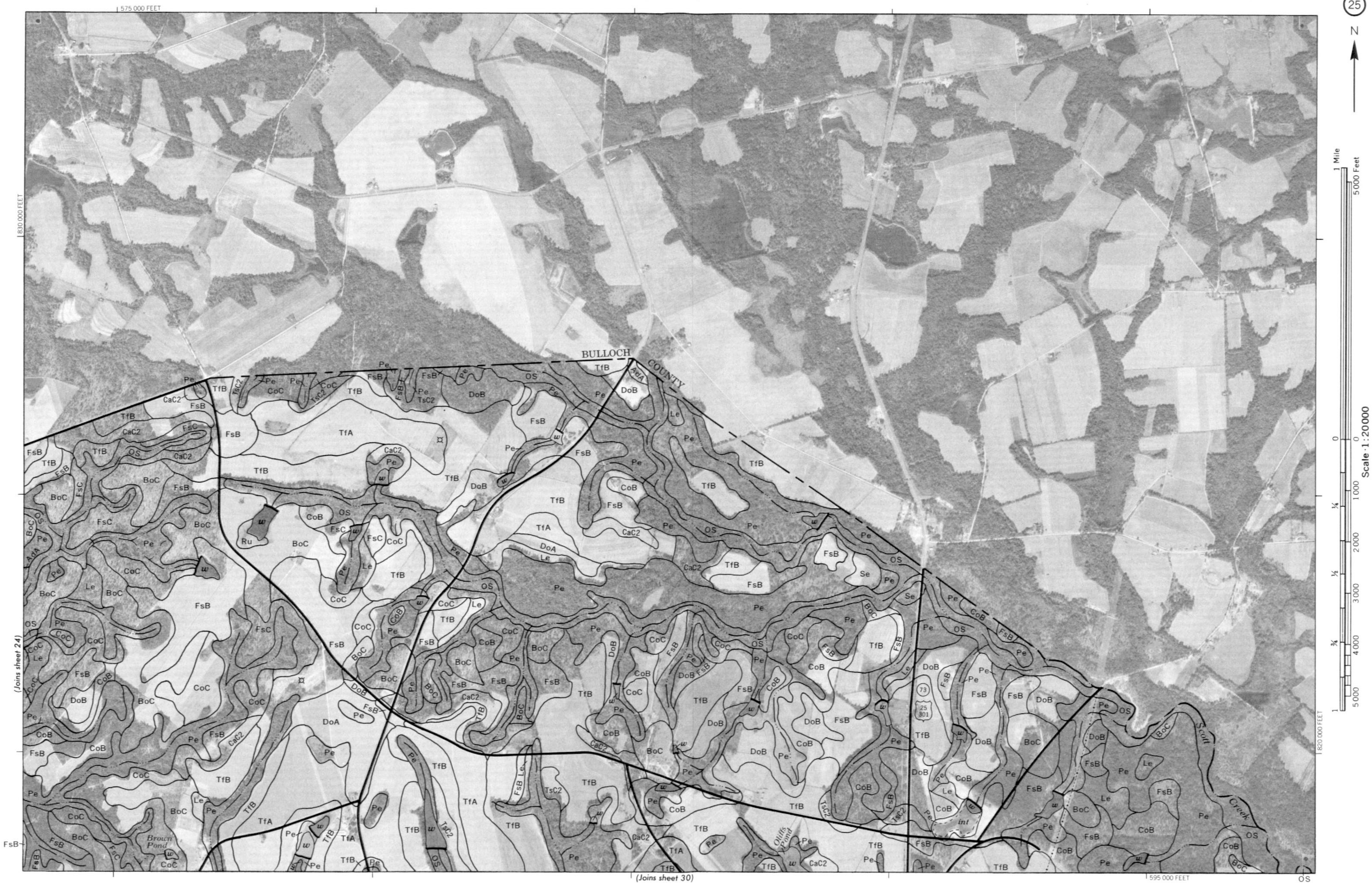

(Joins sheet 16)
(Joins sheet 19)
(Joins sheet 24)
N
Scale 1:20000
1 Mile
5000 Feet
570 000 FEET
850 000 FEET
835 000 FEET
550 000 FEET
Excelsior
BULLOCH COUNTY
Ten Mile Creek
Bad Prong Creek
water

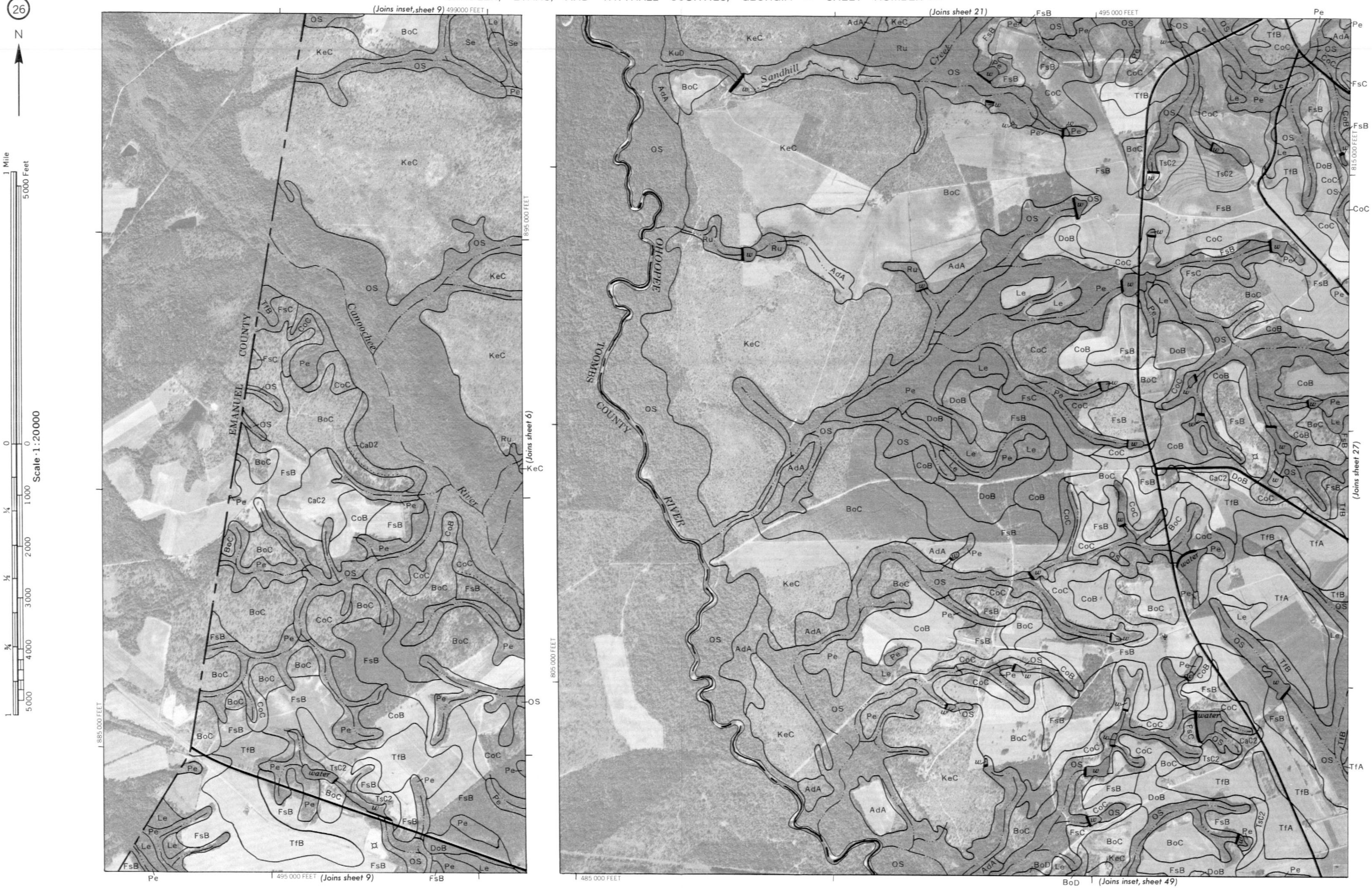

21
N
(Joins sheet 17)
(Joins sheet 22)
(Joins sheet 26)
(Joins sheet 13)
475 000 FEET
830 000 FEET
820 000 FEET
500 000 FEET
473 000 FEET
855 000 FEET
850 000 FEET
2000 AND 5000-FOOT GRID TICKS
EMANUEL COUNTY
TOOMBS COUNTY
OHOOPEE RIVER
Beaver Creek
Sandhill Creek
Brown Pond
152
Scale 1:20000
1 Mile
5000 Feet
0
1000
2000
3000
4000
5000
¼
½
¾

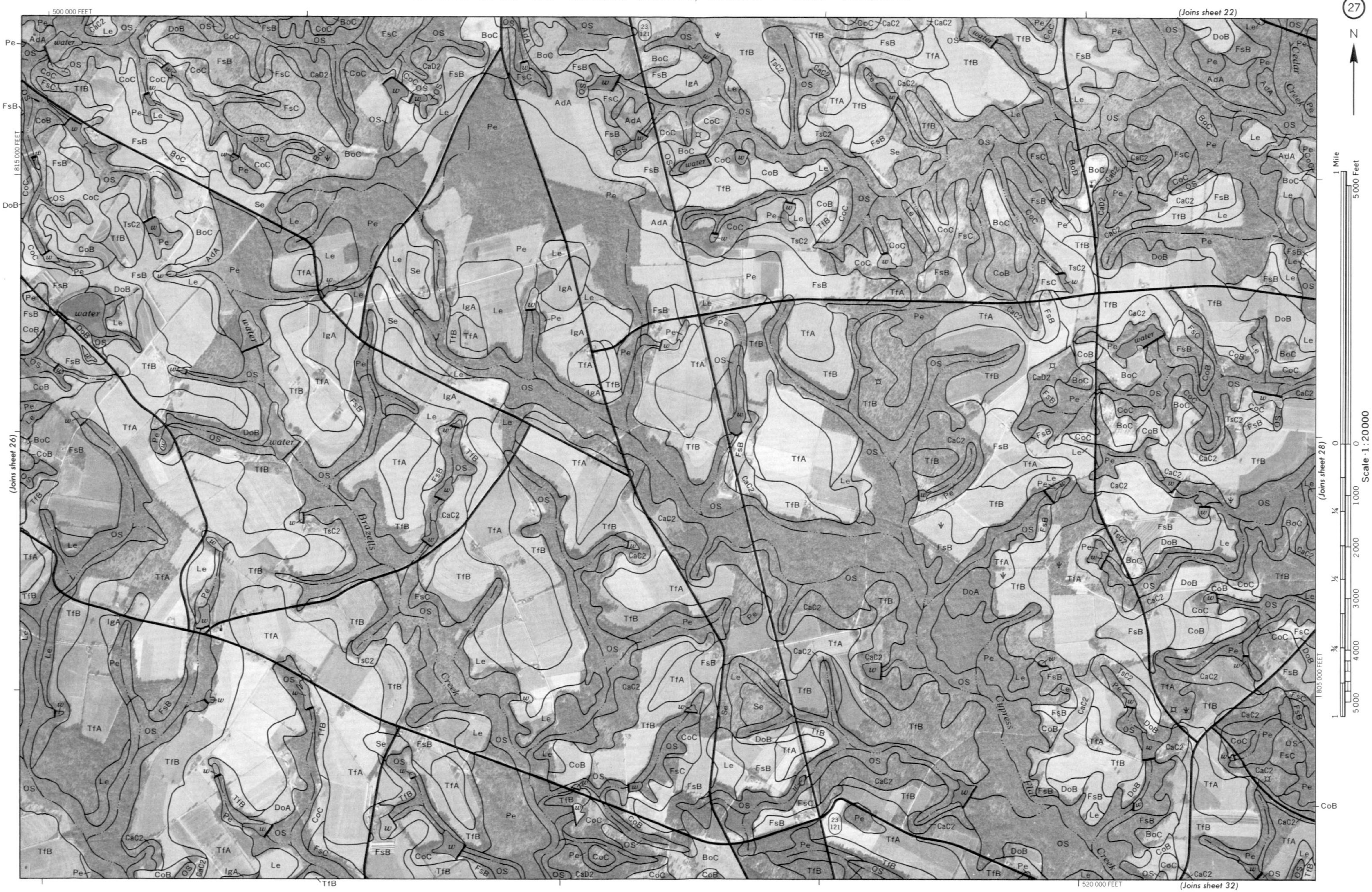

22
N
(Joins sheet 18)
(Joins sheet 21)
(Joins sheet 23)
(Joins sheet 27)
520 000 FEET
830 000 FEET
820 000 FEET
500 000 FEET
Cobbtown
Cedar
Creek
Sandhill
Creek
CANDLER
TATTNALL
COUNTY
COUNTY
water
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1000
2000
3000
4000
5000


23
N
(Joins sheet 19)
(Joins sheet 22)
(Joins sheet 24)
(Joins sheet 28)
Canoochee River
CANDLER COUNTY
EVANS COUNTY
TATTNALL COUNTY
525 000 FEET
545 000 FEET
830 000 FEET
820 000 FEET
1 Mile
5000 Feet
Scale 1:20000


24
N
(Joins sheet 20)
(Joins sheet 23)
(Joins sheet 25)
(Joins sheet 29)
Scale 1:20000
1 Mile
5000 Feet
570 000 FEET
830 000 FEET
820 000 FEET
550 000 FEET
CANDLER COUNTY
EVANS COUNTY
BULLOCH COUNTY
Canoochee River
Ten Mile Creek
Dry Creek
water
129

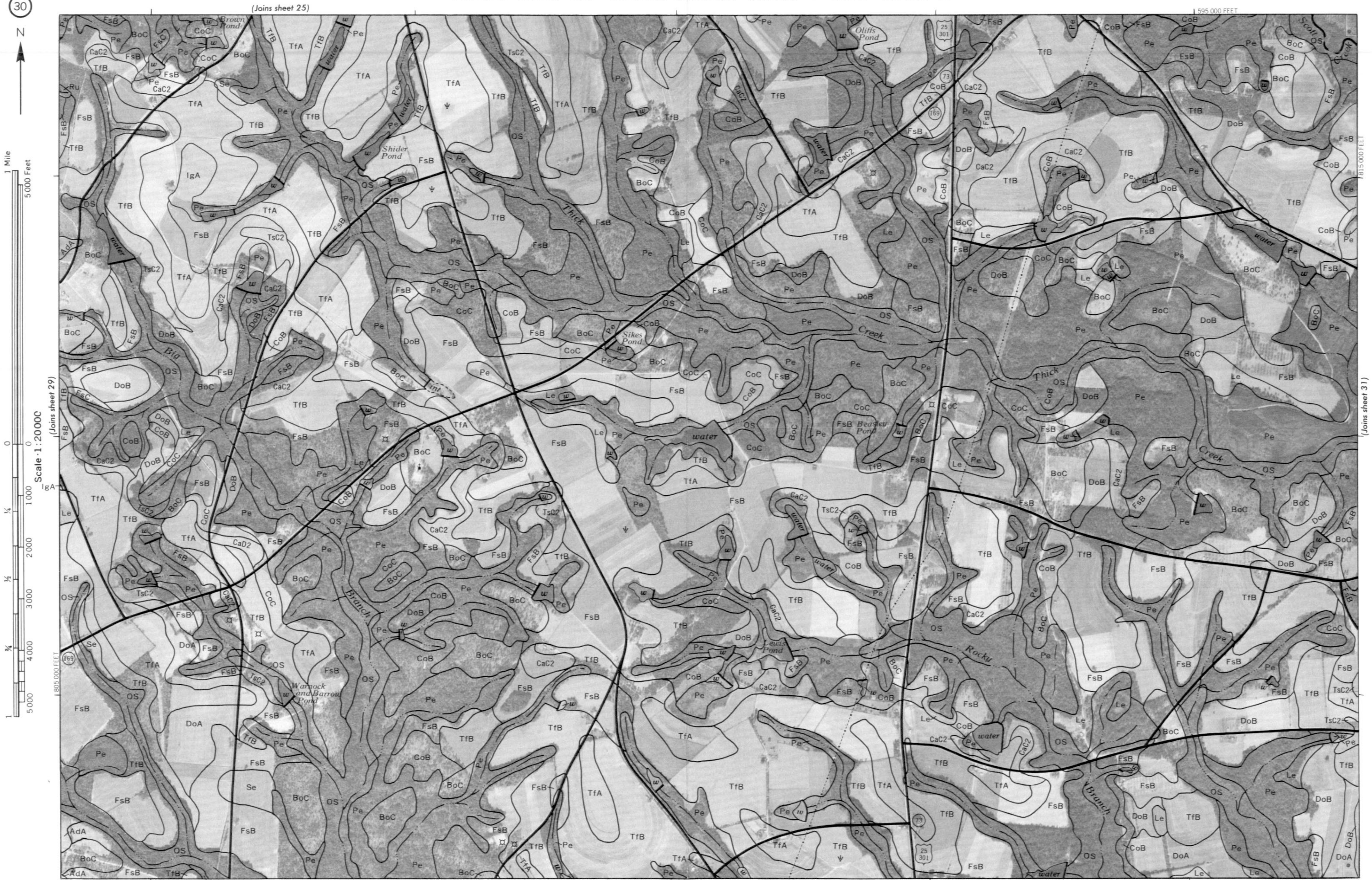

25
N
575 000 FEET
830 000 FEET
820 000 FEET
595 000 FEET
BULLOCH COUNTY
Brown Pond
Scott Creek
(Joins sheet 24)
(Joins sheet 30)
1 Mile
5 000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000

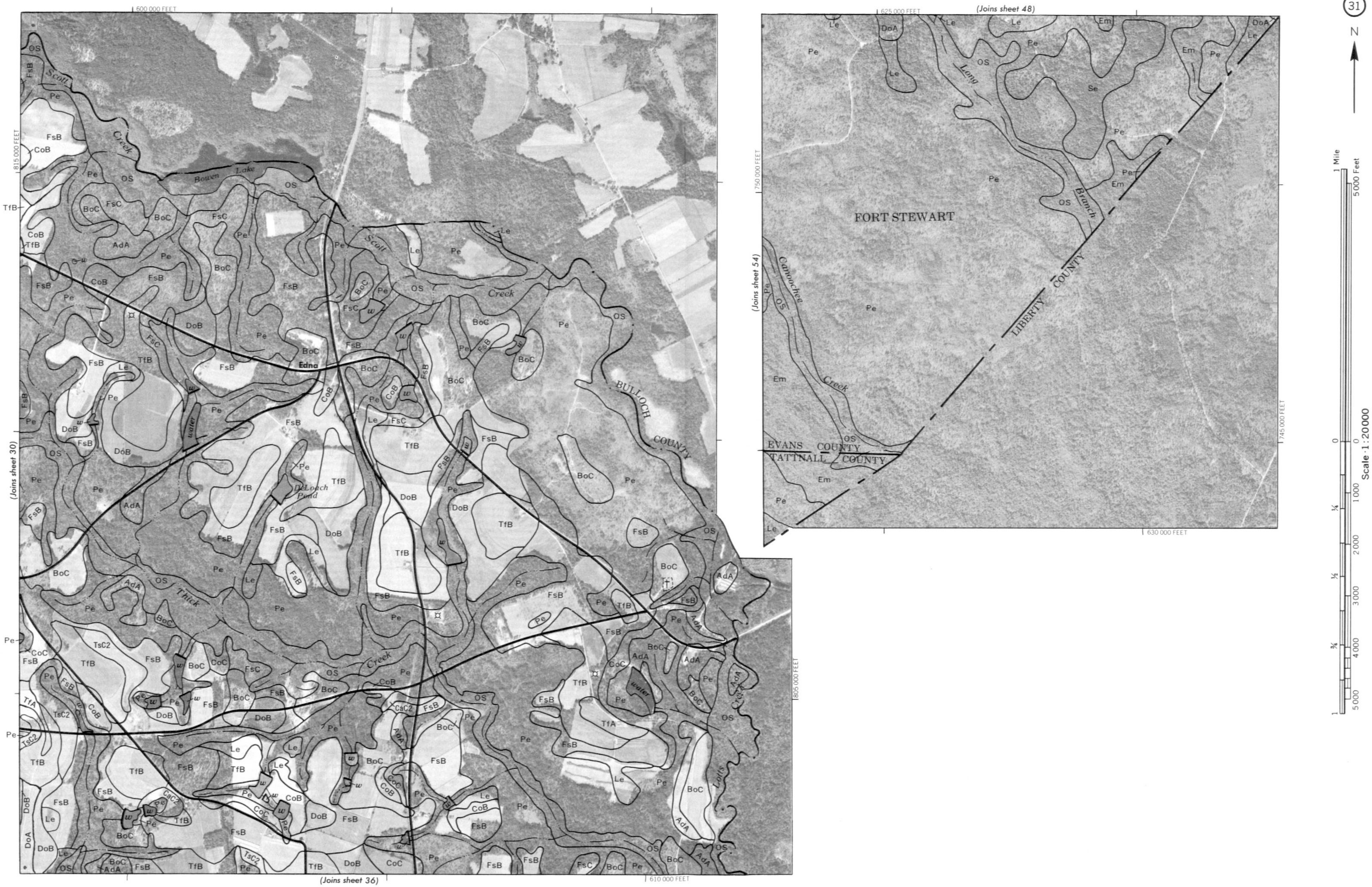

26
N
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
¼
½
¾
(Joins inset, sheet 9)
499 000 FEET
(Joins sheet 21)
495 000 FEET
895 000 FEET
885 000 FEET
805 000 FEET
815 000 FEET
485 000 FEET
(Joins sheet 6)
(Joins sheet 27)
(Joins sheet 9)
(Joins inset, sheet 49)
EMANUEL COUNTY
TOOMBS COUNTY
OHOOPEE RIVER
Canoochee River
Sandhill Creek
water
OS
BoC
KeC
Le
Se
Pe
TfB
FsC
CoC
FsB
CaD2
CaC2
CoB
TsC2
DoB
Ru
AdA
KuD
TfA
FsC
DoB
BoD
CoB
Le

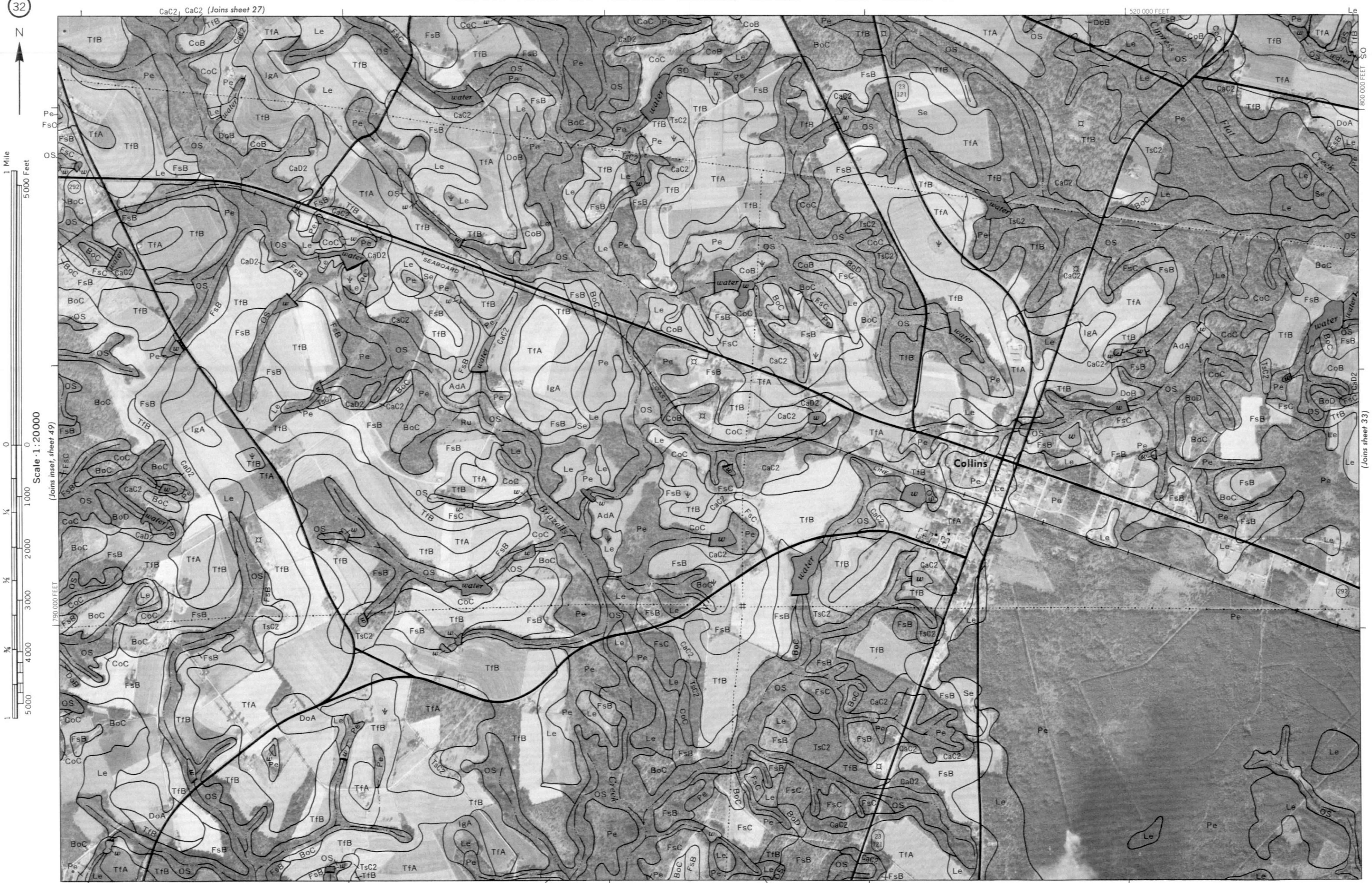

27
N
500 000 FEET
815 000 FEET
805 000 FEET
520 000 FEET
(Joins sheet 22)
(Joins sheet 26)
(Joins sheet 28)
(Joins sheet 32)
1 Mile
5000 Feet
Scale 1:20000
Brazells Creek
Cypress Flat Creek
Cedar Creek
23
121


N
(Joins sheet 23)
(Joins sheet 27)
(Joins sheet 29)
(Joins sheet 33)
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
0
¼
½
¾
1
545 000 FEET
815 000 FEET
805 000 FEET
525 000 FEET
Cedar
Creek
Cedar
Creek
TATTNALL
EVANS
COUNTY
COUNTY
Half
water
Creek
water

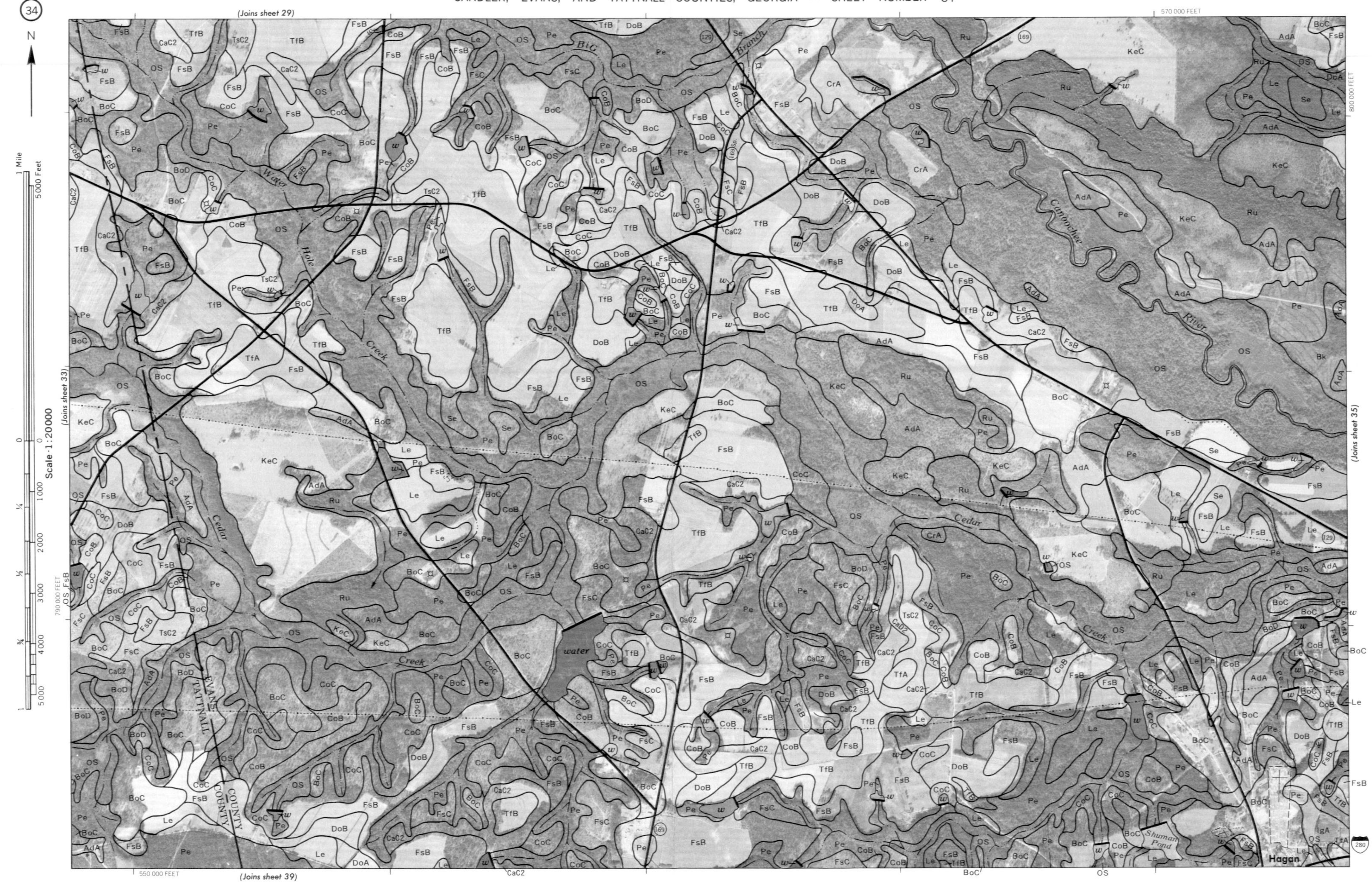

29
N
(Joins sheet 24)
(Joins sheet 28)
(Joins sheet 30)
(Joins sheet 34)
550 000 FEET
570 000 FEET
815 000 FEET
805 000 FEET
1 Mile
5000 Feet
Scale 1:20000
Mose Pond
Dry Creek
Yarbrough Pond
Canoochee River
Big Branch
Big Branch
water
129
169


(Joins sheet 25)
(Joins sheet 29)
(Joins sheet 31)
(Joins sheet 35)
595 000 FEET
815 000 FEET
805 000 FEET
575 000 FEET
Scale 1:20000
1 Mile
5000 Feet
Brown Pond
Oliffs Pond
Shider Pond
Sikes Pond
Beasley Pond
Lewis Pond
Warnock and Barrow Pond
Thick Creek
Big Branch
Rocky Branch
Scott Creek


31
N
600 000 FEET
815 000 FEET
610 000 FEET
805 000 FEET
625 000 FEET
630 000 FEET
750 000 FEET
745 000 FEET
(Joins sheet 30)
(Joins sheet 36)
(Joins sheet 48)
(Joins sheet 54)
Scott Creek
Bowen Lake
Edna
DeLoach Pond
Thick Creek
Lotts Creek
BULLOCH COUNTY
FORT STEWART
Long Branch
Canoochee Creek
LIBERTY COUNTY
EVANS COUNTY
TATTNALL COUNTY
1 Mile
5000 Feet
Scale 1:20000

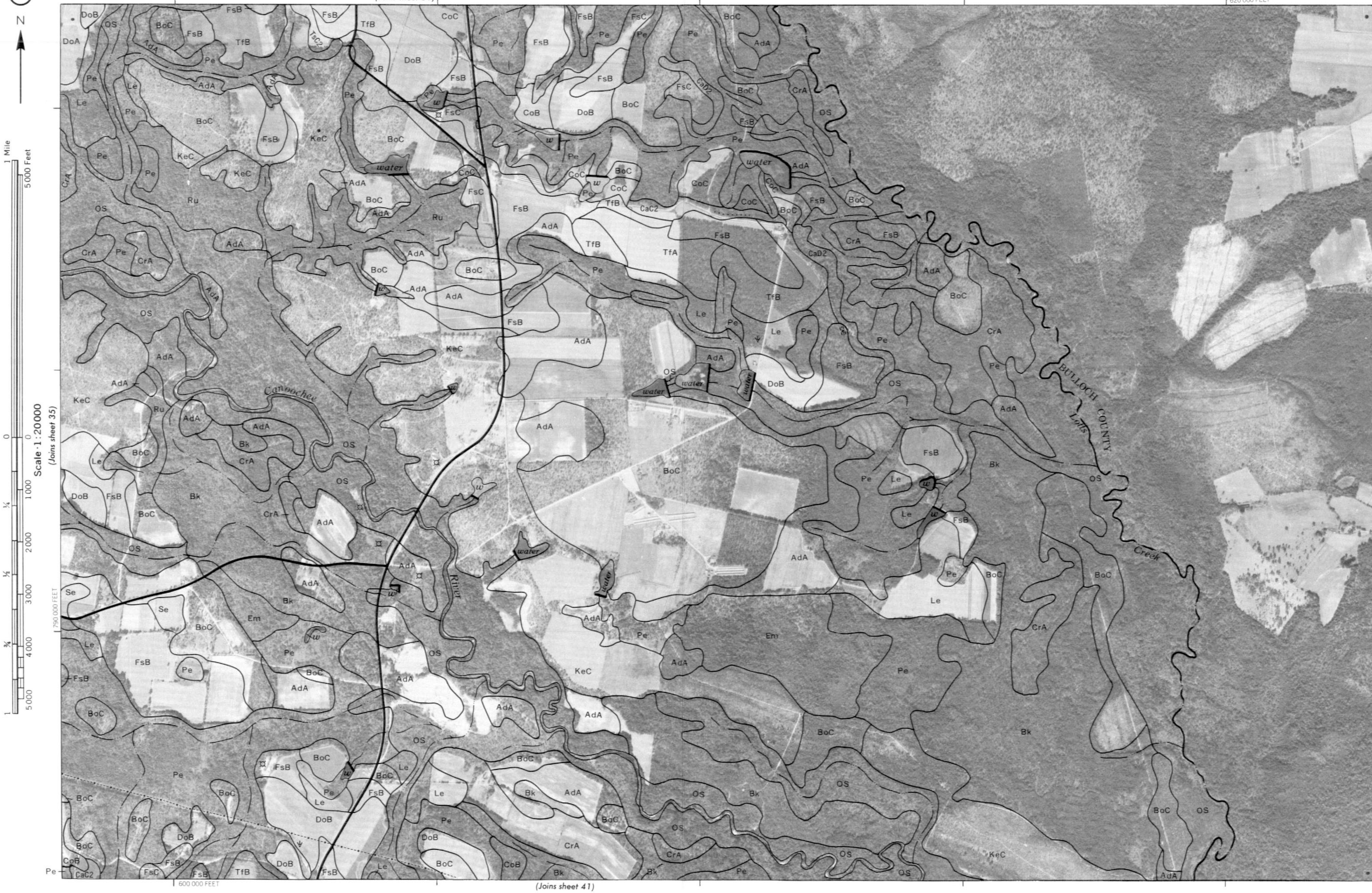

(Joins sheet 27)
(Joins sheet 33)
(Joins sheet 37)
(Joins inset, sheet 49)
N
1 Mile
5000 Feet
Scale 1:20000
520 000 FEET
800 000 FEET
790 000 FEET
500 000 FEET
Collins
SEABOARD
COAST
LINE
Brazells
Creek
Flat
Creek
Cypress
water
292
23
121

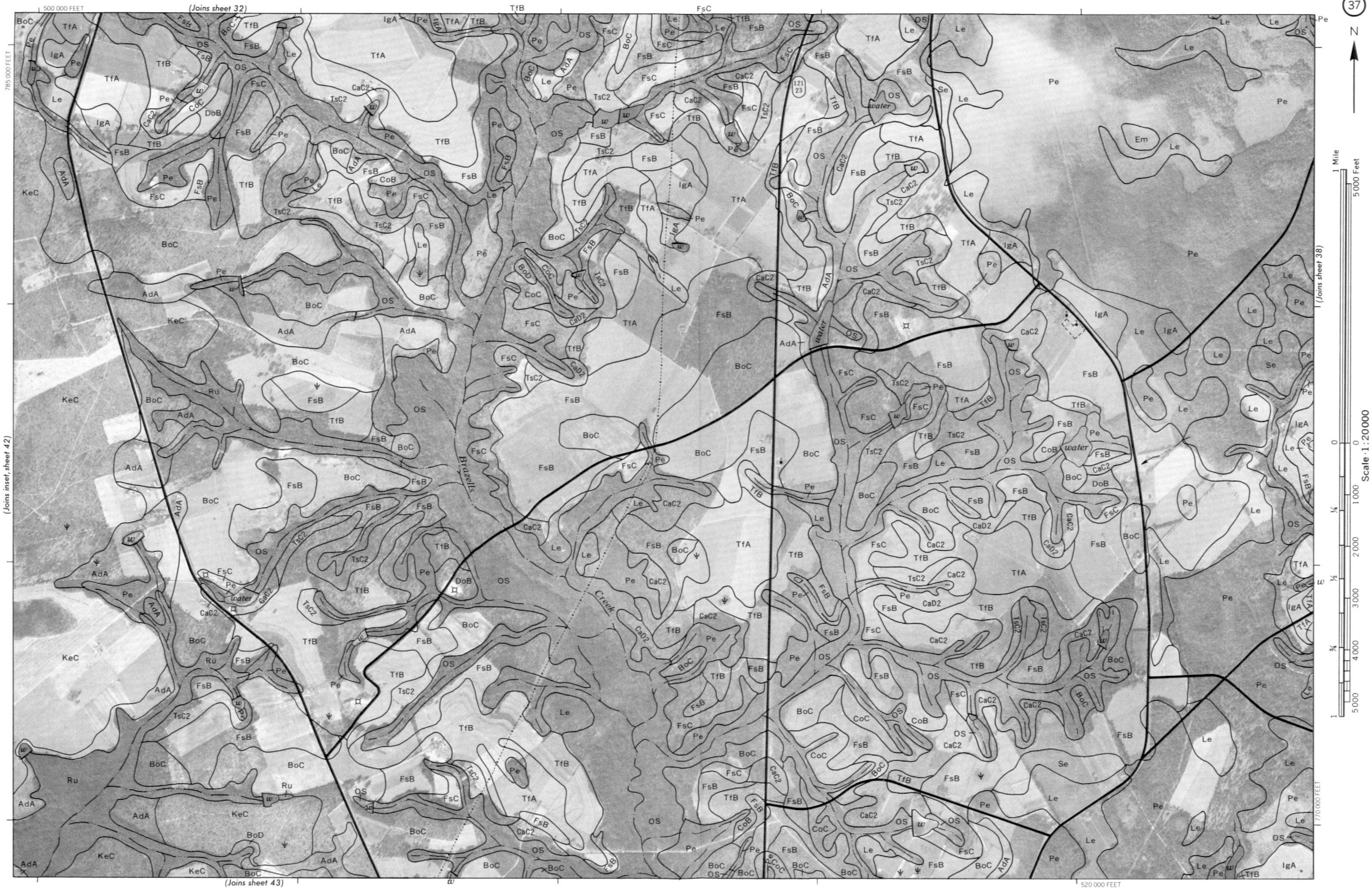

33
N
EVANS CO
(Joins sheet 28)
(Joins sheet 32)
(Joins sheet 34)
(Joins sheet 38)
525 000 FEET
545 000 FEET
800 000 FEET
790 000 FEET
Cypress
Cedar
Flat
Creek
Creek
SEABOARD
COAST
LINE
Manassas
292
water
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000

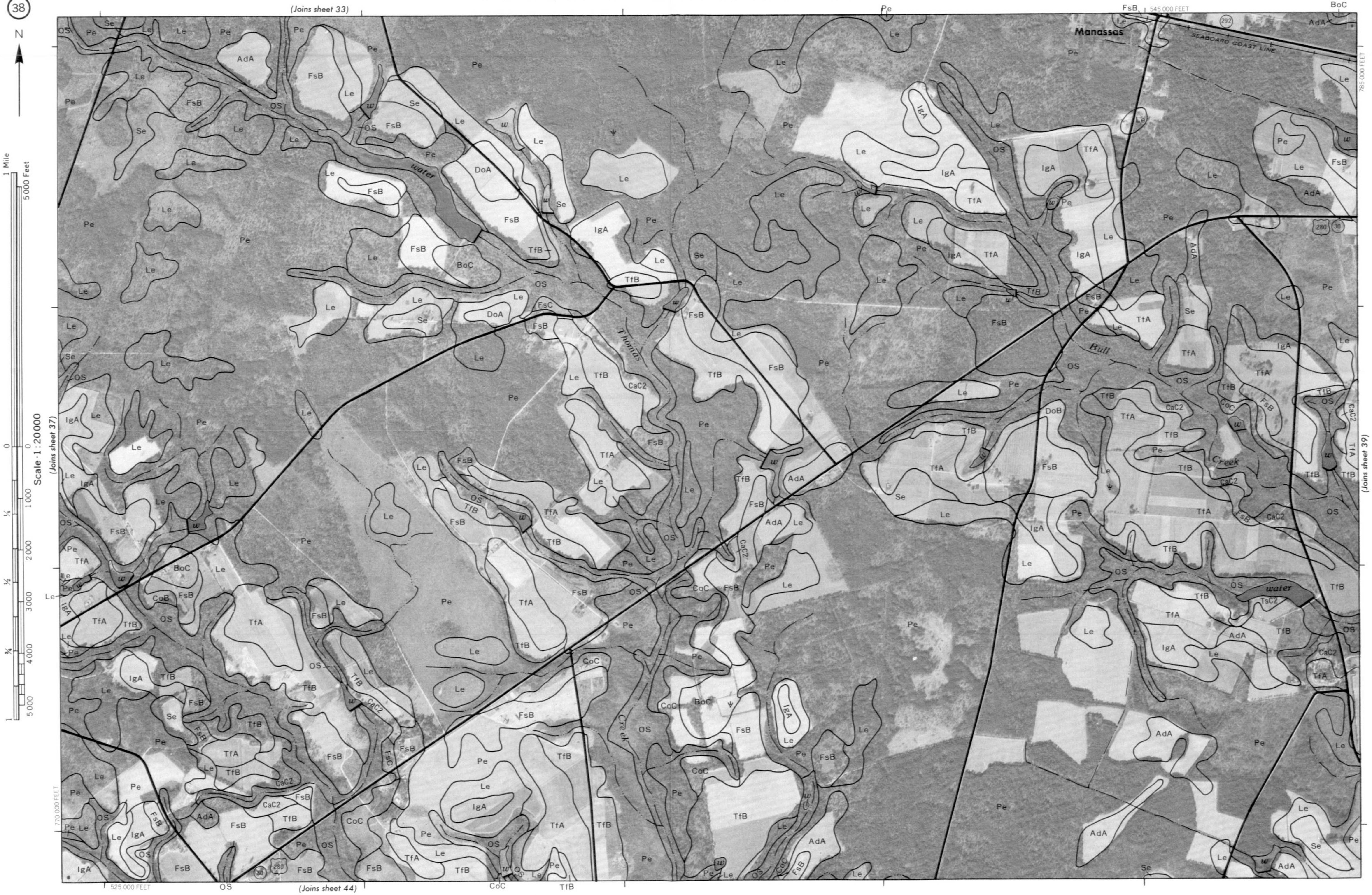

34
N
(Joins sheet 29)
(Joins sheet 33)
(Joins sheet 35)
(Joins sheet 39)
Scale 1:20000
1 Mile
5000 Feet
570 000 FEET
800 000 FEET
790 000 FEET
550 000 FEET
Big Branch
Water Hole Creek
Canoochee River
Cedar Creek
EVANS COUNTY
TATTNALL COUNTY
Shuman Pond
water
Hagan
129
169
280
30

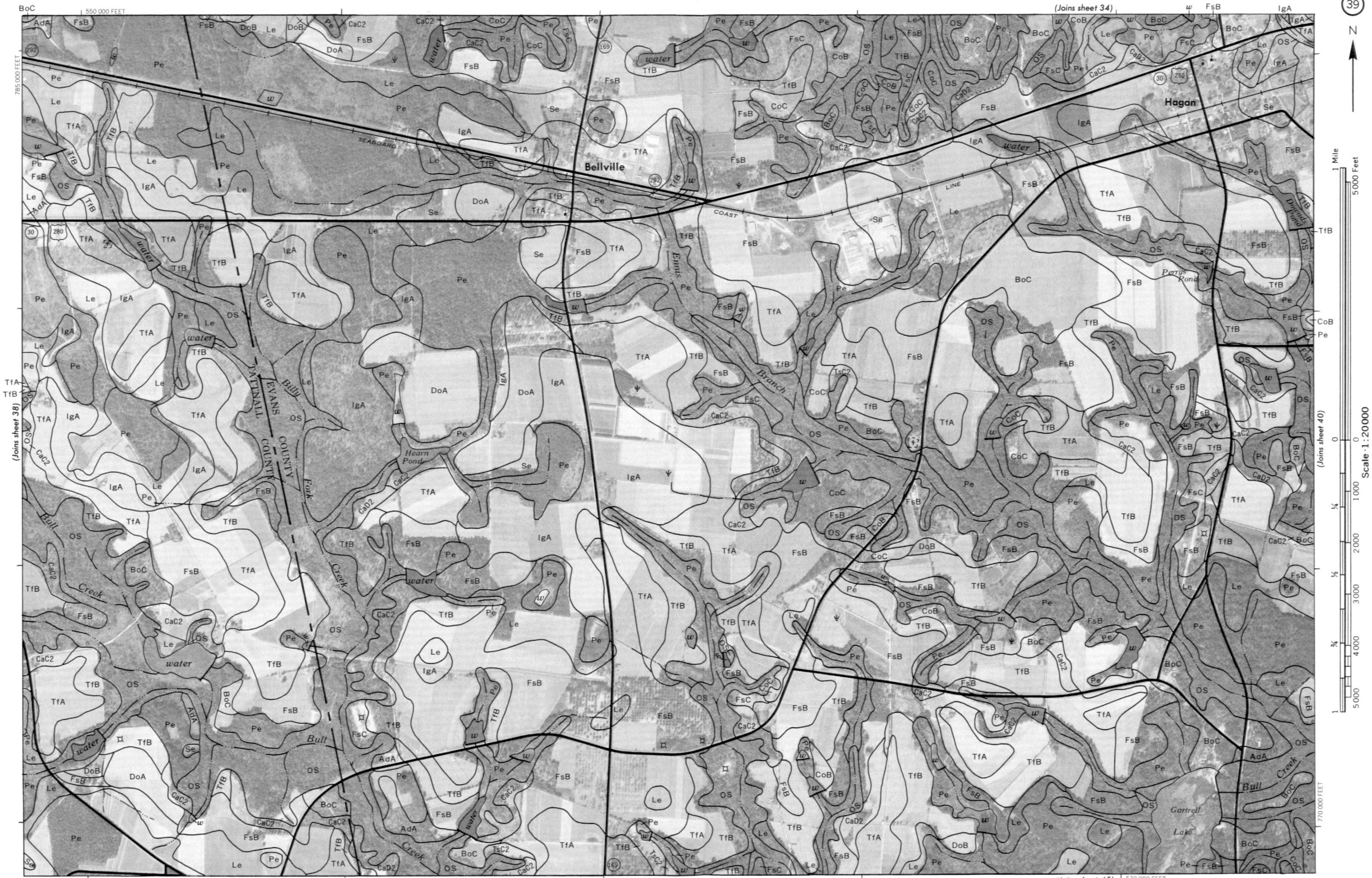

35
N
575 000 FEET
800 000 FEET
790 000 FEET
595 000 FEET
(Joins sheet 30)
(Joins sheet 34)
(Joins sheet 36)
(Joins sheet 40)
CLAXTON
(county seat)
Big Branch
Canoochee River
Rocky Branch
Cedar Creek
SEABOARD COAST LINE
water
1 Mile
5000 Feet
Scale 1:20000

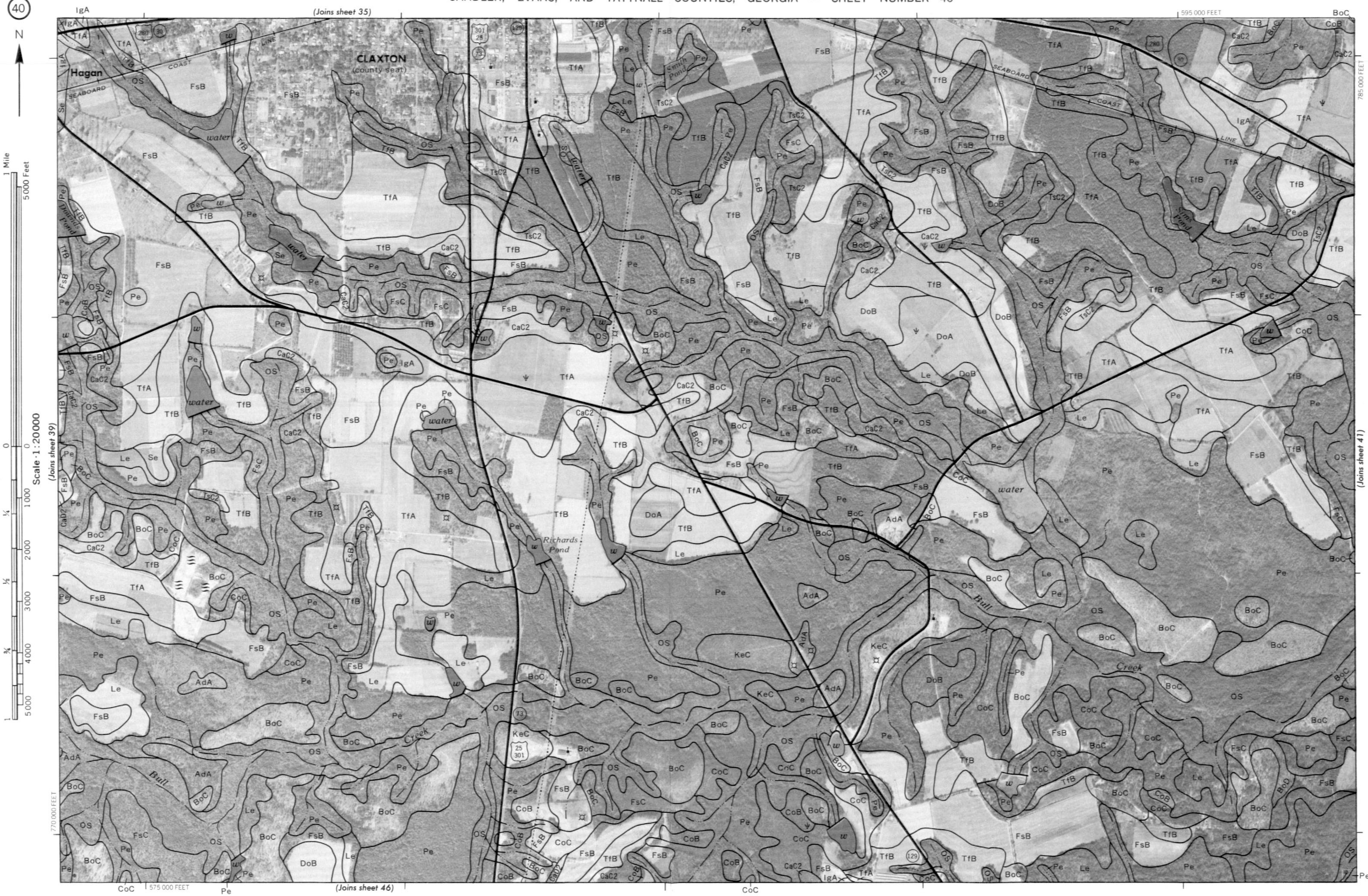
CANDLER, EVANS, AND TATTNALL COUNTIES, GEORGIA — SHEET NUMBER 36



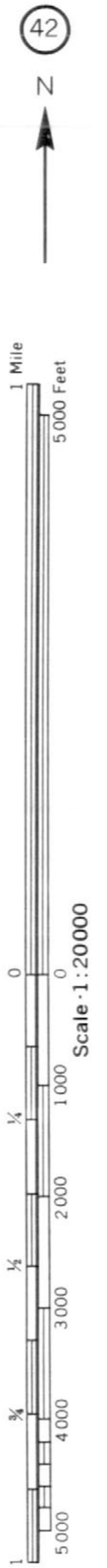

37
N
(Joins sheet 32)
(Joins sheet 38)
(Joins sheet 43)
(Joins inset, sheet 42)
500 000 FEET
520 000 FEET
785 000 FEET
770 000 FEET
Brazells
Creek
water
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
¼
½
¾
1


(Joins sheet 33)
(Joins sheet 37)
(Joins sheet 39)
(Joins sheet 44)
N
1 Mile
5000 Feet
Scale 1:20000
Manassas
SEABOARD COAST LINE
545 000 FEET
785 000 FEET
270 000 FEET
525 000 FEET
Thomas
Bull
Creek
water


39
N
(Joins sheet 34)
(Joins sheet 38)
(Joins sheet 40)
(Joins sheet 45)
550 000 FEET
570 000 FEET
785 000 FEET
770 000 FEET
Bellville
Hagan
SEABOARD
COAST
LINE
TATTNALL COUNTY
EVANS COUNTY
Billy Fork Creek
Ennis Branch
Bull Creek
Hearn Pond
Perrys Pond
Gartrell Lake
water
1 Mile
5000 Feet
Scale 1:20000


40
N
(Joins sheet 35)
(Joins sheet 39)
(Joins sheet 41)
(Joins sheet 46)
CLAXTON
(county seat)
Hagan
Scale 1:20000
1 Mile
5000 Feet
595 000 FEET
785 000 FEET
575 000 FEET
770 000 FEET
Richards Pond
Smith Pond
Bull Creek

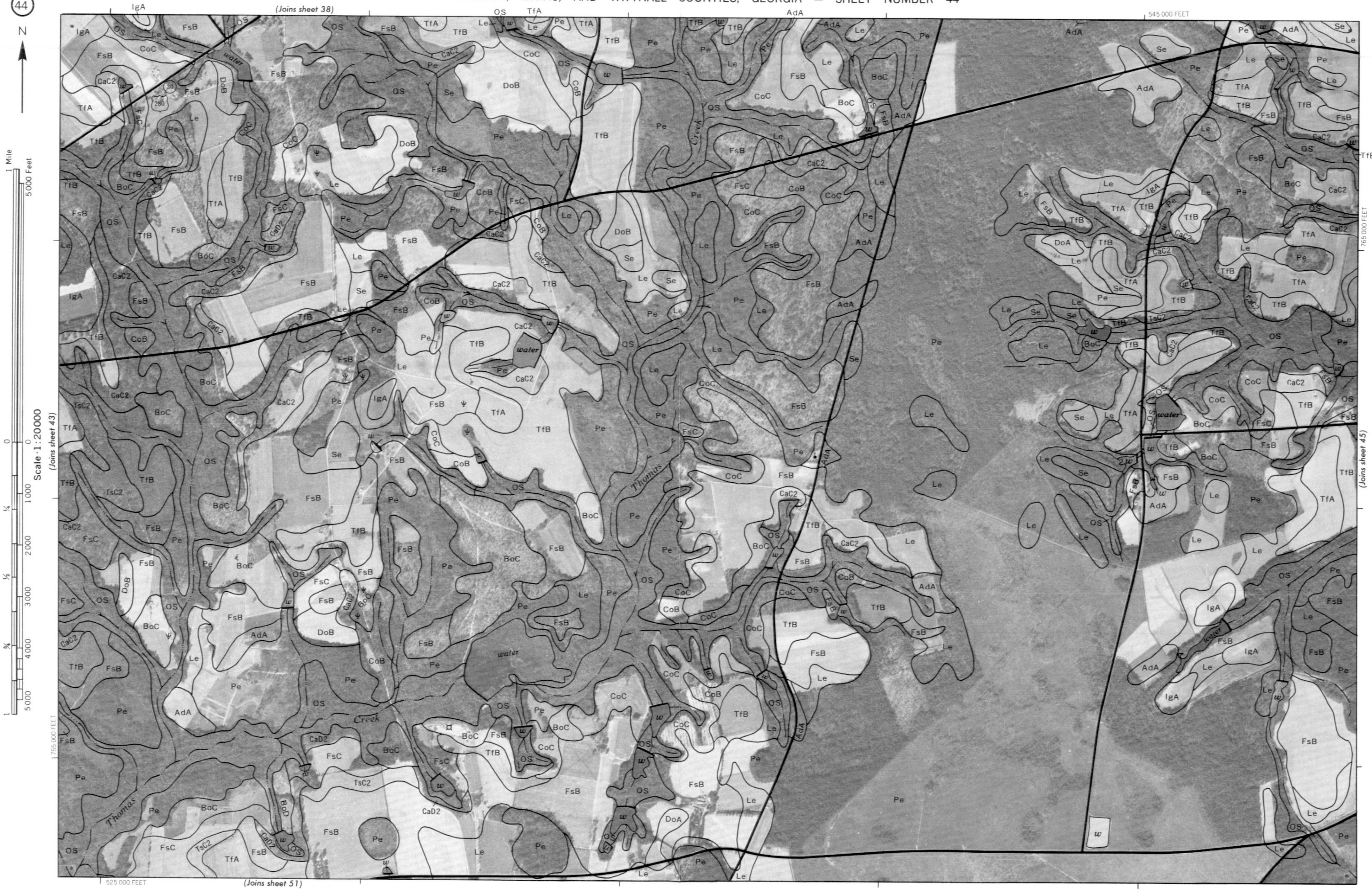

41
N
(Joins sheet 36)
(Joins sheet 40)
(Joins inset, sheet 48)
(Joins sheet 47)
600 000 FEET
620 000 FEET
785 000 FEET
770 000 FEET
Daisy
SEABOARD
COAST
LINE
Canoochee River
BRYAN COUNTY
BULLOCH COUNTY
Lotts Creek
Bull Creek
Little Bull Creek
Mill Branch
Rogers Branch
Sands Pond
FORT STEWART
water
1 Mile
5000 Feet
Scale 1:20000

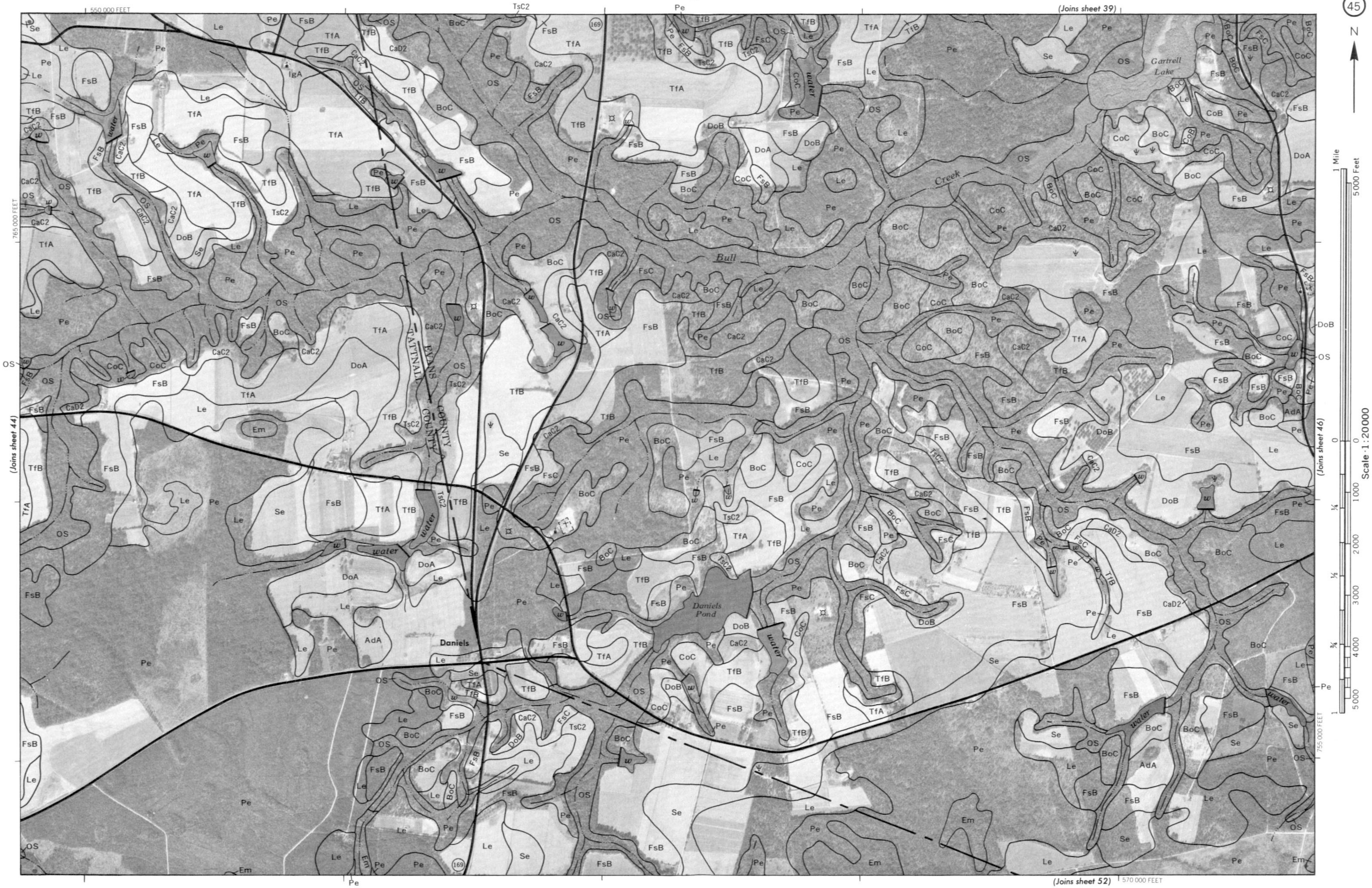

N
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000


497 000 FEET
(Joins inset, sheet 49)
785 000 FEET
(Joins sheet 37)
770 000 FEET
492 000 FEET
(Joins upper right)
OHOOPEE RIVER
TOOMBS COUNTY
OS
KeC
KuD
Ru
BoC
BoD
AdA
CaD2
FsC
FsB
CrA
Le
Pe


(Joins lower left)
495 000 FEET
765 000 FEET
(Joins sheet 43)
755 000 FEET
490 000 FEET
(Joins sheet 49)
OHOOPEE RIVER
TOOMBS COUNTY
Brazells Creek
KeC
KuD
OS
AdA
BoC
CoC
CoB
CrA
DoB
DoA
FsB
FsC
Pe
TfB
TsC2
CaC2
Ru
Le
water


43
N
(Joins sheet 37)
(Joins sheet 42)
(Joins sheet 44)
(Joins sheet 50)
500 000 FEET
520 000 FEET
760 000 FEET
755 000 FEET
REIDSVILLE
(county seat)
Reidsville
Airport
Brazells
Creek
water
280
30
56
147
121
23
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
1000
2000
3000
4000
5000


44
N
(Joins sheet 38)
(Joins sheet 43)
(Joins sheet 45)
(Joins sheet 51)
545 000 FEET
525 000 FEET
765 000 FEET
755 000 FEET
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
Thomas
Creek
water

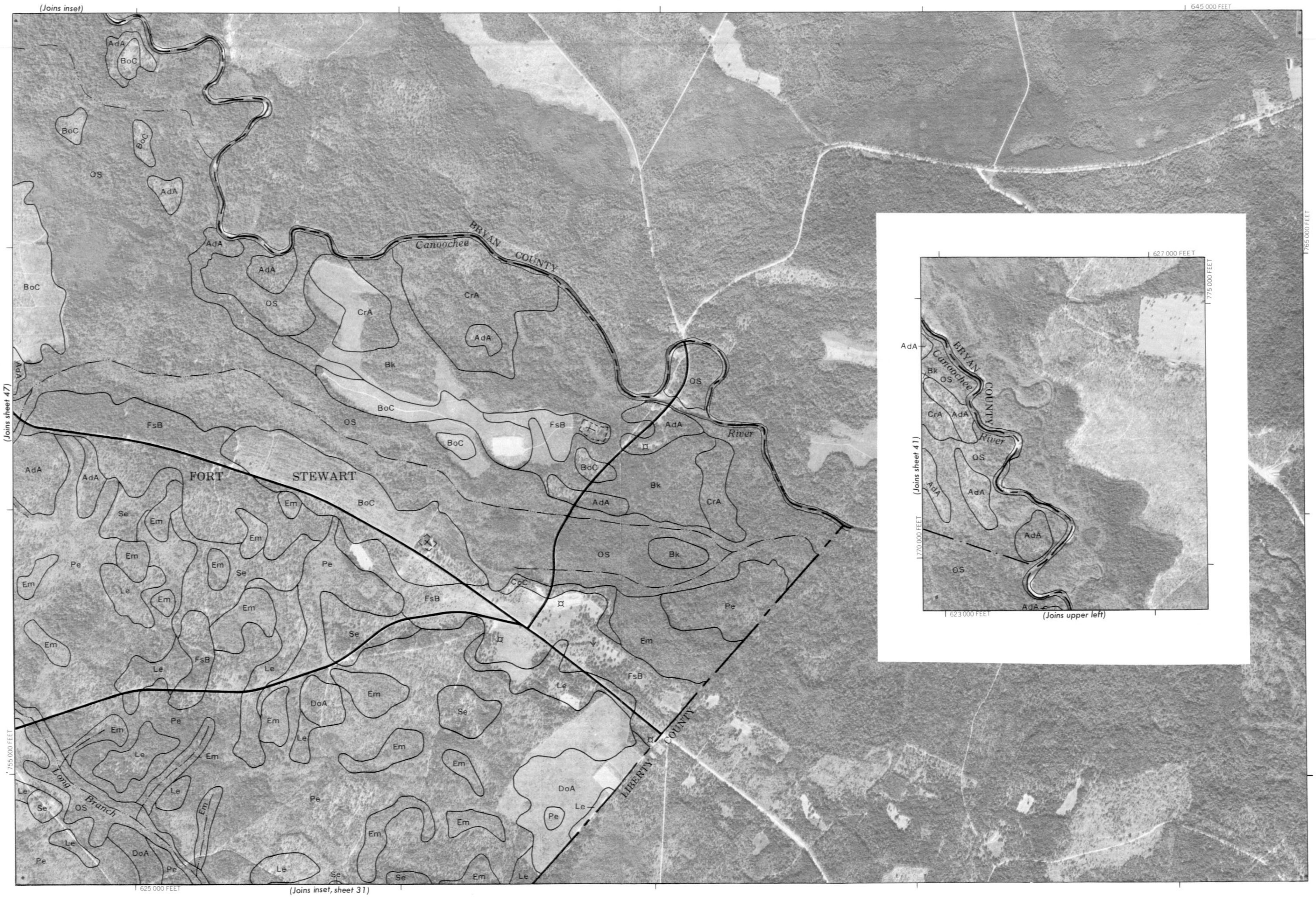

45
N
(Joins sheet 39)
(Joins sheet 44)
(Joins sheet 46)
(Joins sheet 52)
550 000 FEET
570 000 FEET
765 000 FEET
755 000 FEET
Gartrell Lake
Bull
Creek
Daniels Pond
Daniels
TATTNALL COUNTY
EVANS COUNTY
water
169
1 Mile
5000 Feet
Scale 1:20000

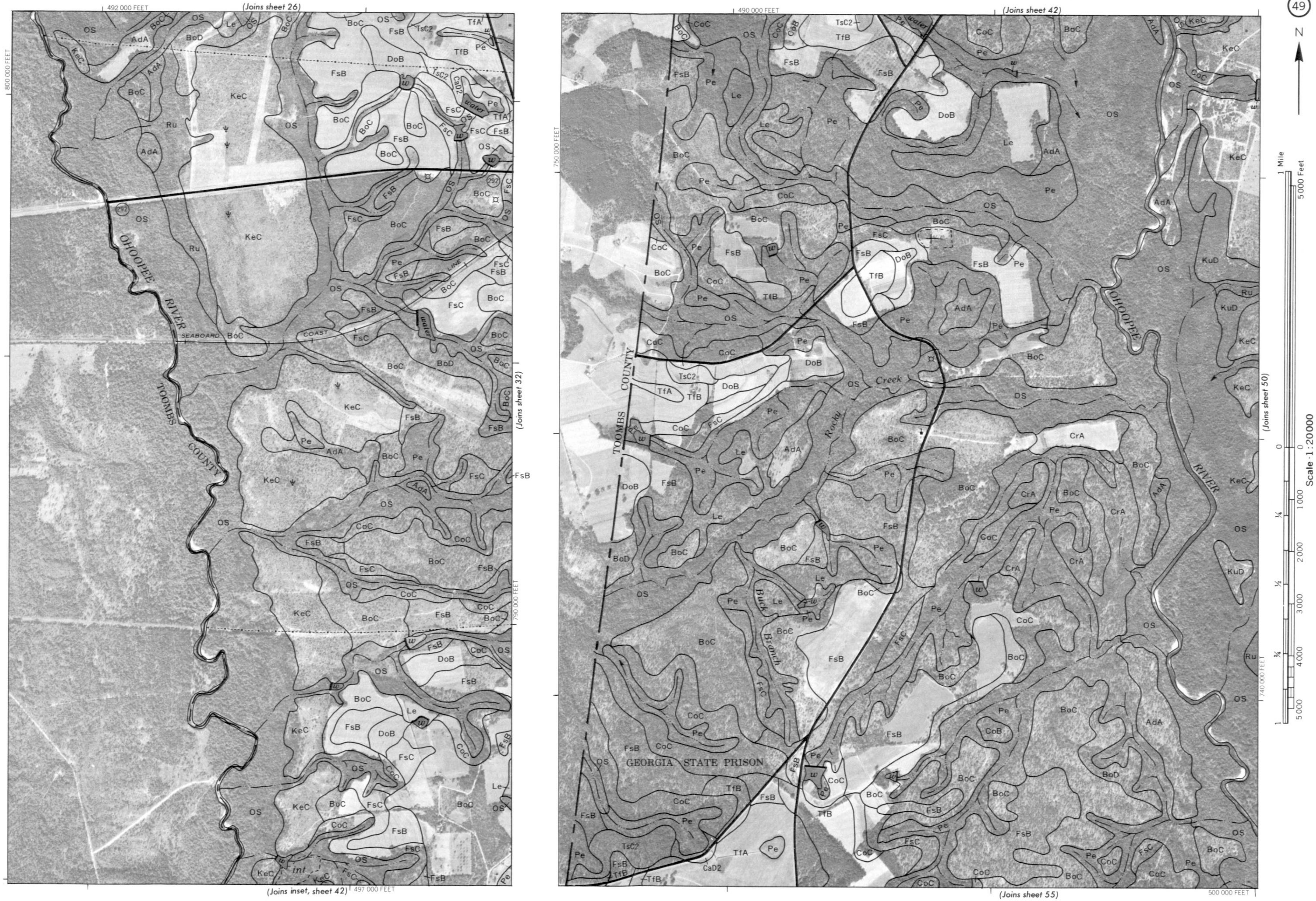

46
N
(Joins sheet 40)
(Joins sheet 45)
(Joins sheet 47)
(Joins sheet 53)
595 000 FEET
575 000 FEET
765 000 FEET
755 000 FEET
1 Mile
5 000 Feet
Scale 1:20000
Deans Crossing
Mill Branch
Rogers
Boss
Little Bull Creek
water


47
N
(Joins sheet 41)
(Joins sheet 46)
(Joins sheet 48)
(Joins sheet 54)
600 000 FEET
620 000 FEET
765 000 FEET
755 000 FEET
Little
Bull
Creek
Tippens Lake
water
Landing
Strip
FORT
STEWART
Long
Branch
Canoochee
Creek
Glissons
Pond
250
129
Scale 1:20000
1 Mile
5000 Feet
0
¼
½
¾
1
1000
2000
3000
4000
5000

N

1 Mile
5000 Feet
Scale 1:20000
0 1000 2000 3000 4000 5000

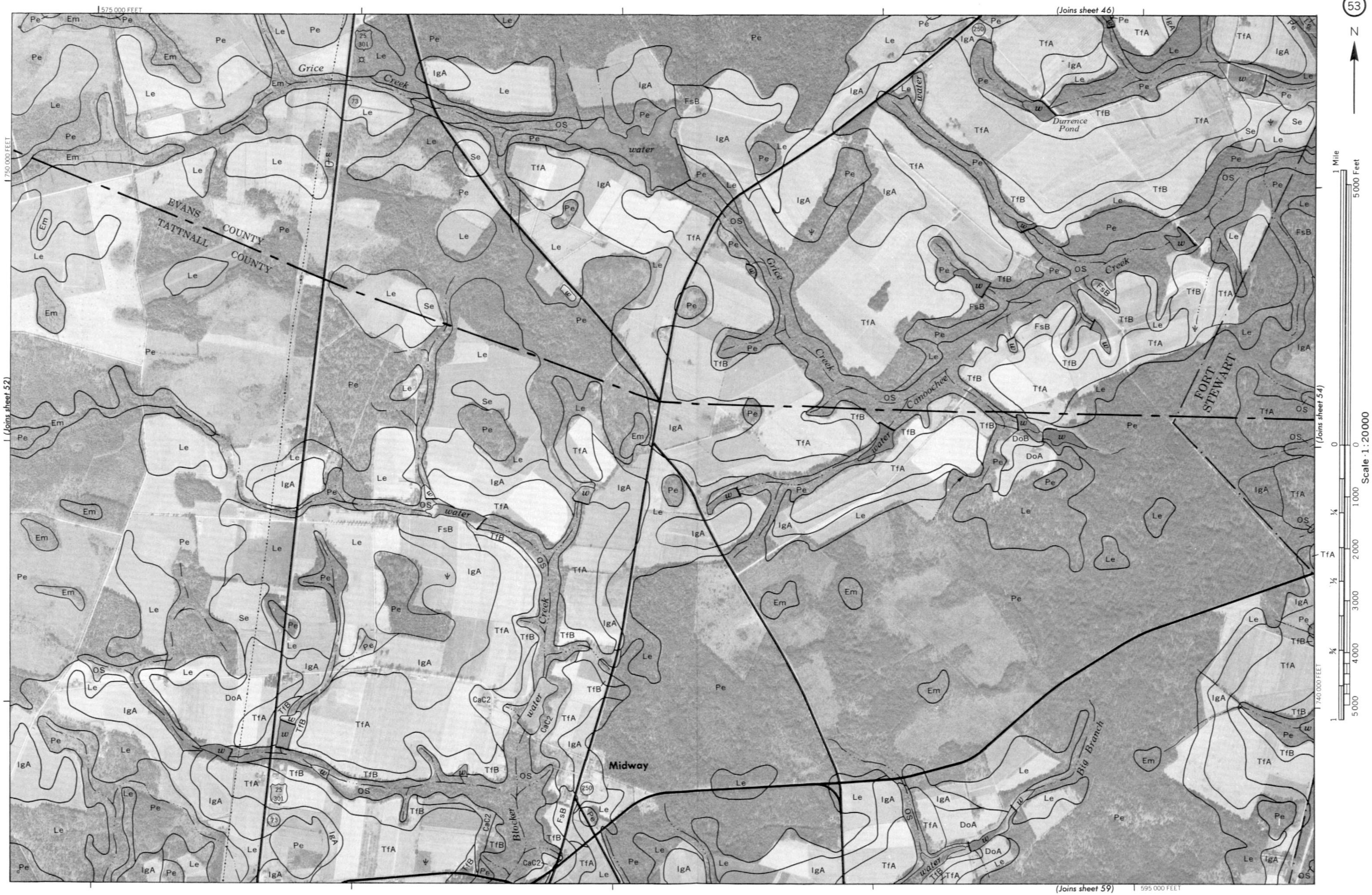


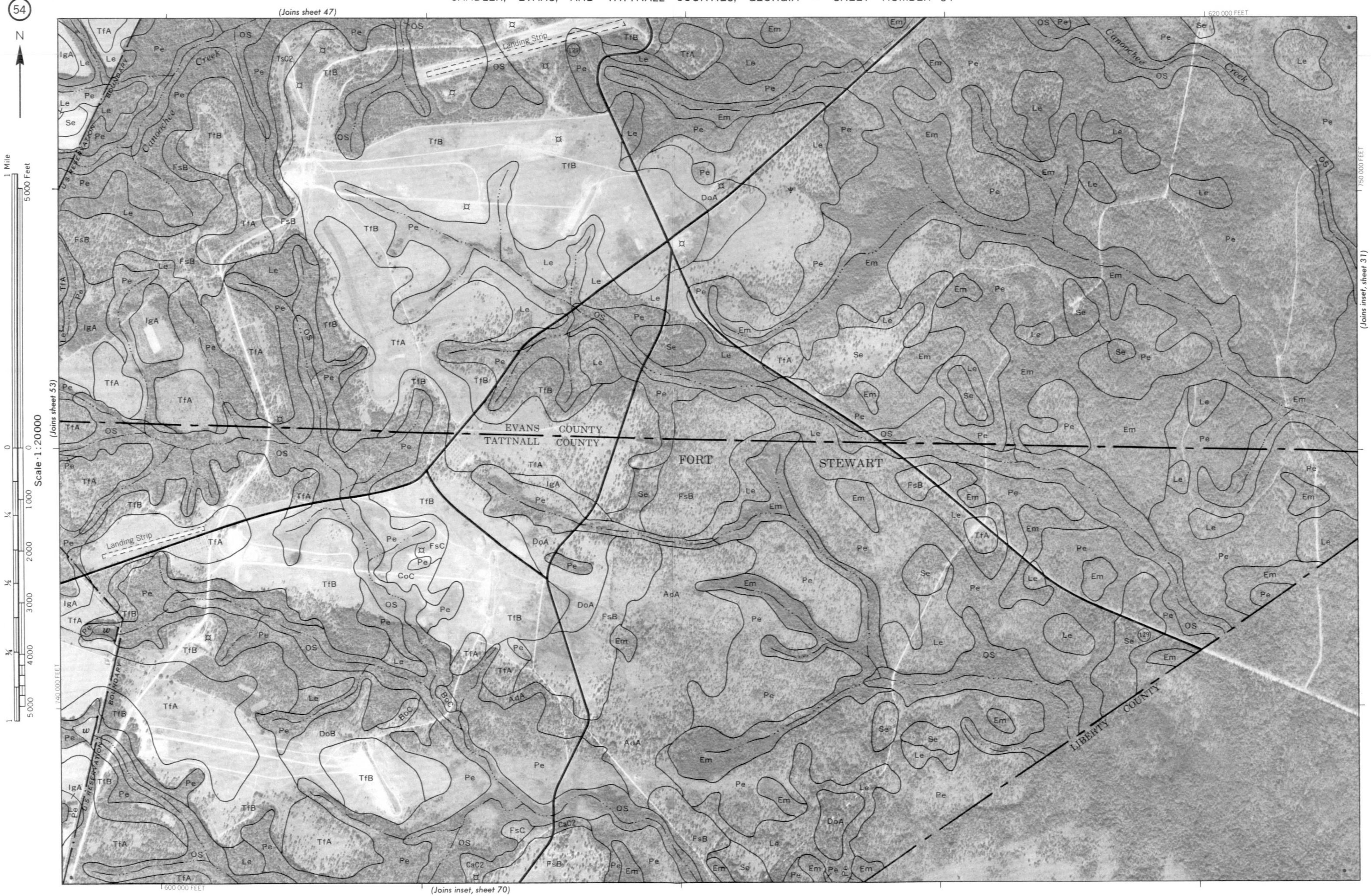

49
N
(Joins sheet 26)
492 000 FEET
800 000 FEET
OHOOPEE RIVER
TOOMBS COUNTY
SEABOARD COAST LINE
(Joins sheet 32)
790 000 FEET
(Joins inset, sheet 42)
497 000 FEET
490 000 FEET
(Joins sheet 42)
750 000 FEET
TOOMBS COUNTY
Rocky Creek
Buck Branch
GEORGIA STATE PRISON
OHOOPEE RIVER
(Joins sheet 50)
740 000 FEET
(Joins sheet 55)
500 000 FEET
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000


50
N
(Joins sheet 43)
(Joins sheet 49)
(Joins sheet 51)
(Joins sheet 56)
520 000 FEET
500 000 FEET
750 000 FEET
740 000 FEET
1 Mile
5 000 Feet
Scale 1:20 000
Reidsville Airport
water
Thomas
Creek
OHOOPEE RIVER
147
23
121
KeC
AdA
Ru
BoC
OS
Pe
KuD
FsB
FsC
TfA
TfB
TsC2
CaC2
CaD2
CoC
CoB
Le
Se
w

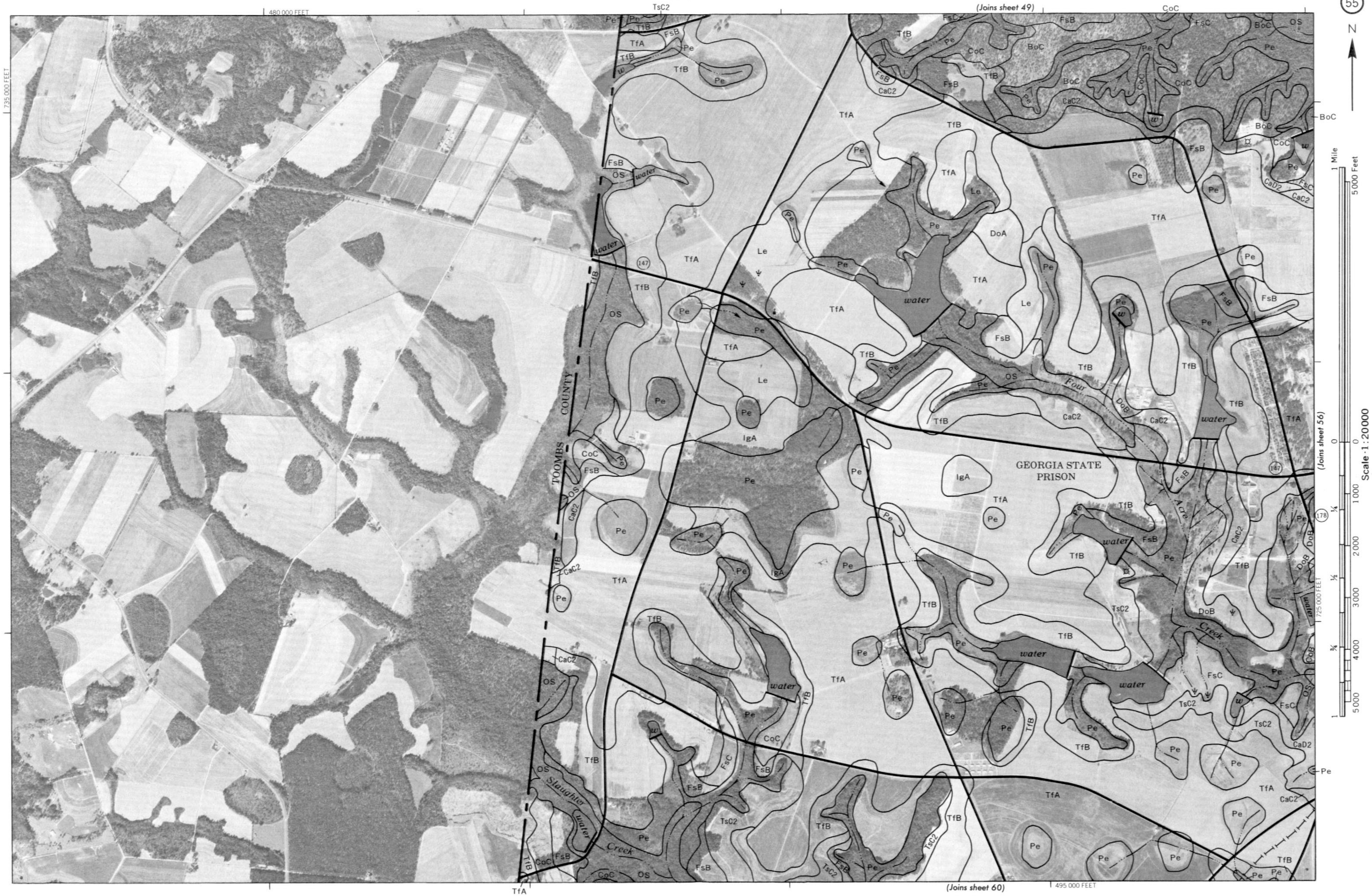

51
N
(Joins sheet 44)
(Joins sheet 50)
(Joins sheet 52)
(Joins sheet 57)
525 000 FEET
545 000 FEET
750 000 FEET
740 000 FEET
1 Mile
5 000 Feet
Scale 1:20000
Thomas Creek
Battle Creek
Tootle Airport (Pvt)
water
121
23
Pe
Le
FsB
FsC
TfA
TfB
IgA
OS
DoA
DoB
BoC
CaC2
CoC
CoB
Se
Em
int


52
N
(Joins sheet 45)
(Joins sheet 51)
(Joins sheet 53)
(Joins sheet 58)
570 000 FEET
750 000 FEET
740 000 FEET
550 000 FEET
EVANS COUNTY
TATTNALL COUNTY
Mill
Creek
169
Scale 1:20000
1 Mile
5000 Feet
Em
Le
Pe
Se
FsB
OS
BoC
IgA
TfA
TfB
DoA
DoB
TsC2
CaC2
FsC
w
water

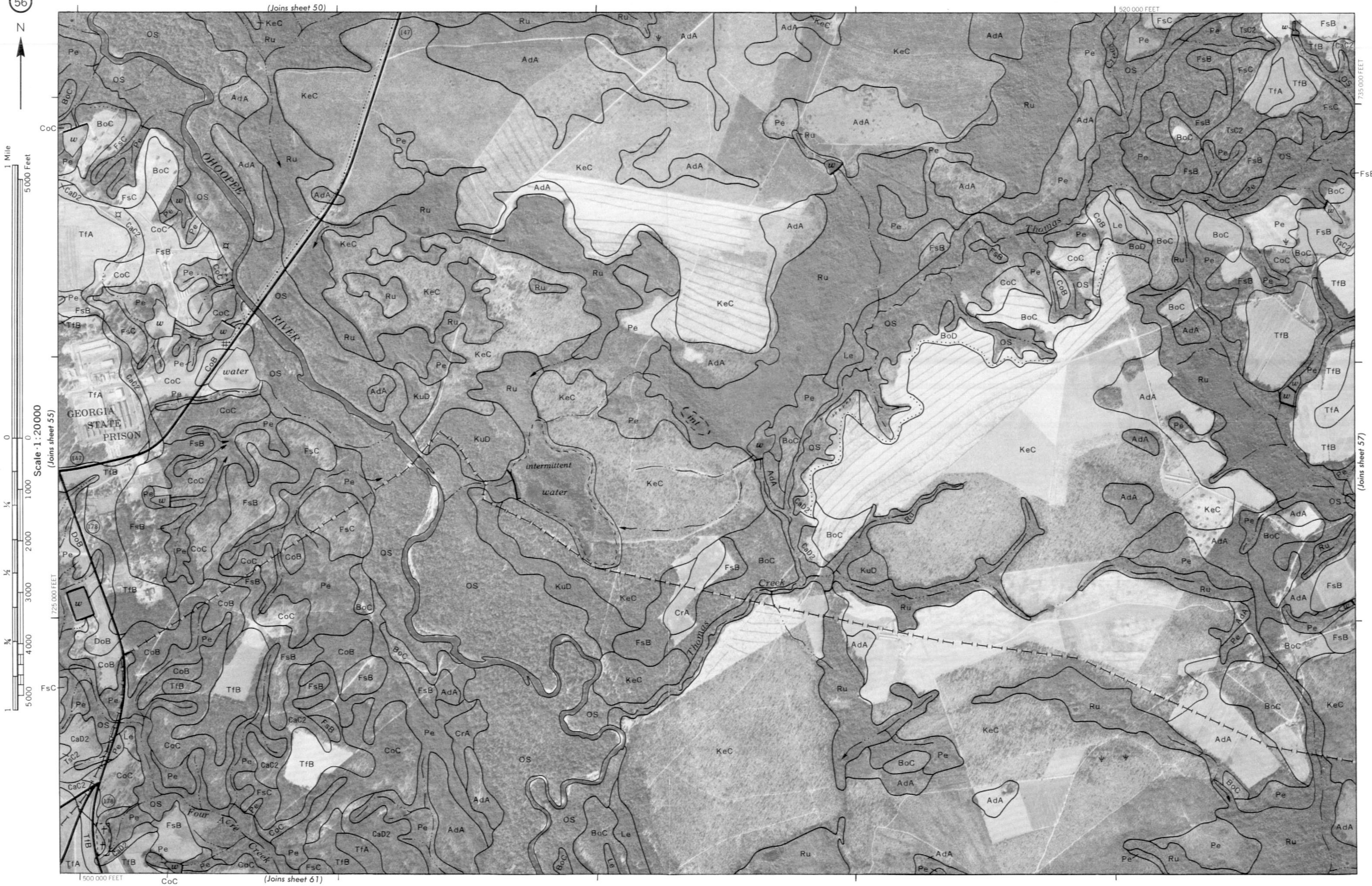

53
N
(Joins sheet 46)
(Joins sheet 52)
(Joins sheet 54)
(Joins sheet 59)
575 000 FEET
595 000 FEET
750 000 FEET
740 000 FEET
EVANS COUNTY
TATTNALL COUNTY
FORT STEWART
Grice Creek
Canoochee Creek
Blocker Creek
Big Branch
Durrence Pond
Midway
water
1 Mile
5000 Feet
Scale 1:20000


(Joins sheet 47)
(Joins sheet 53)
(Joins inset, sheet 31)
(Joins inset, sheet 70)
N
1 Mile
5000 Feet
Scale 1:20000
Landing Strip
Canoochee Creek
U S RESERVATION BOUNDARY
EVANS COUNTY
TATTNALL COUNTY
FORT STEWART
LIBERTY COUNTY
620 000 FEET
750 000 FEET
740 000 FEET
600 000 FEET

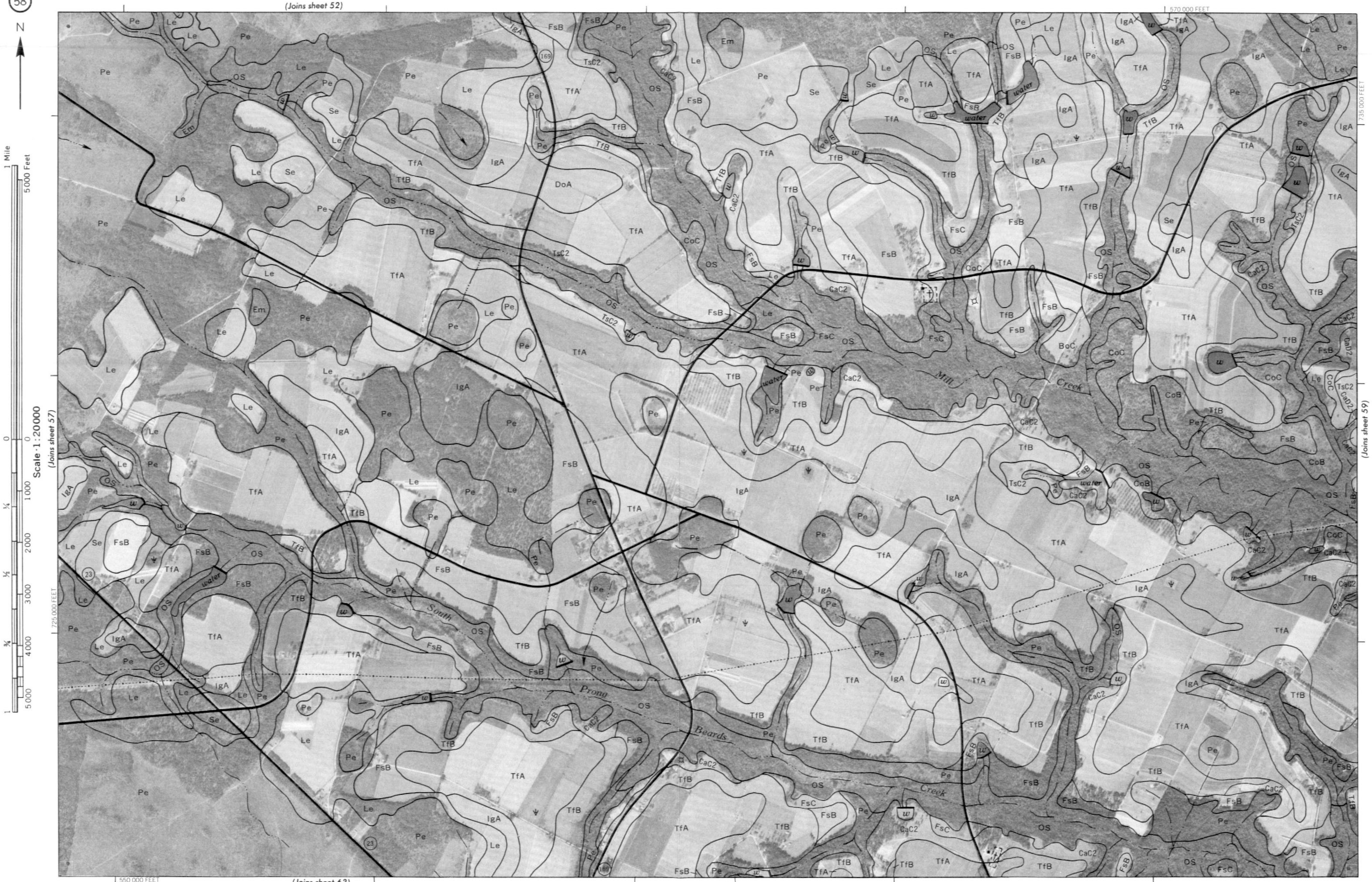
55

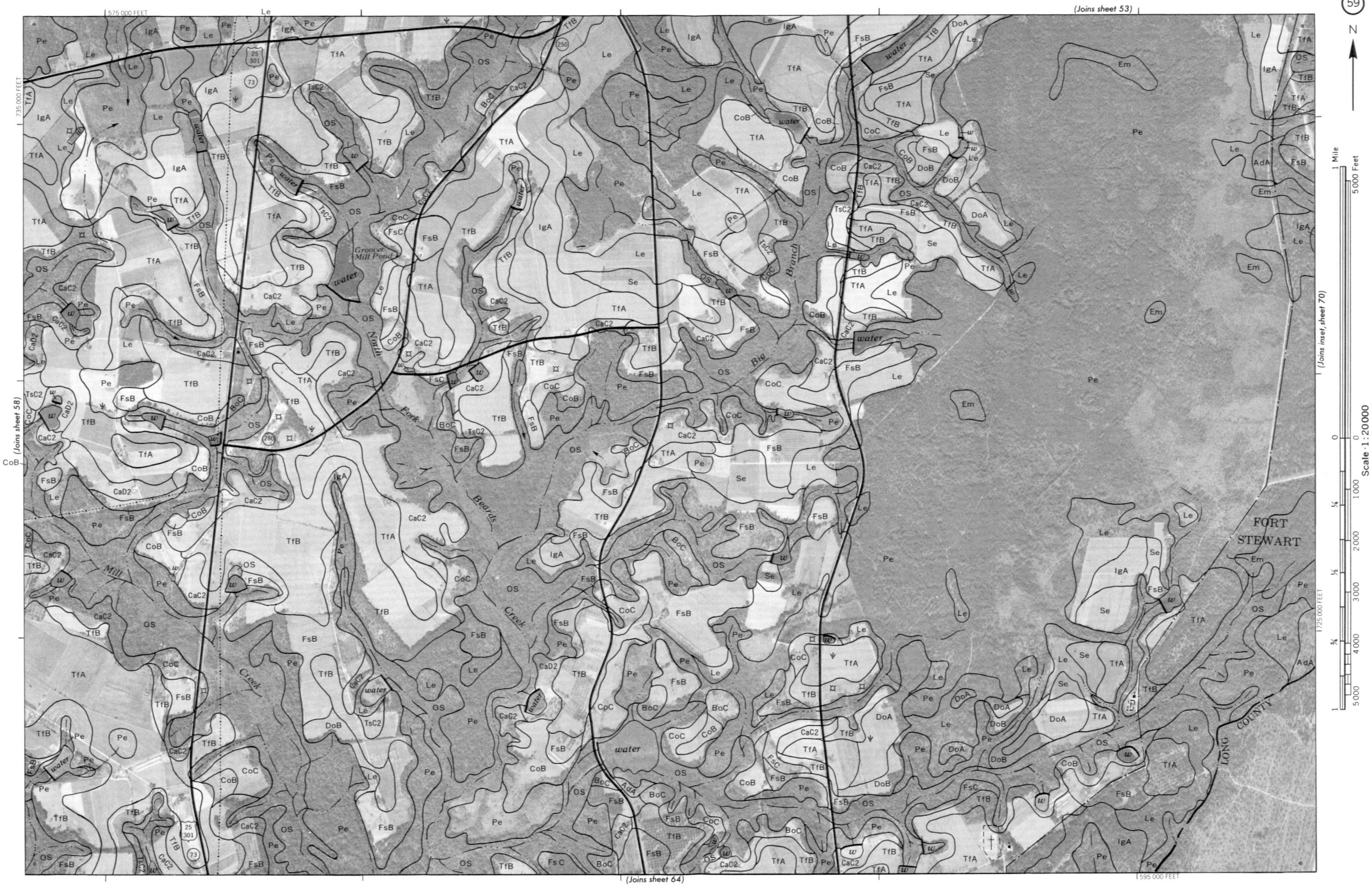


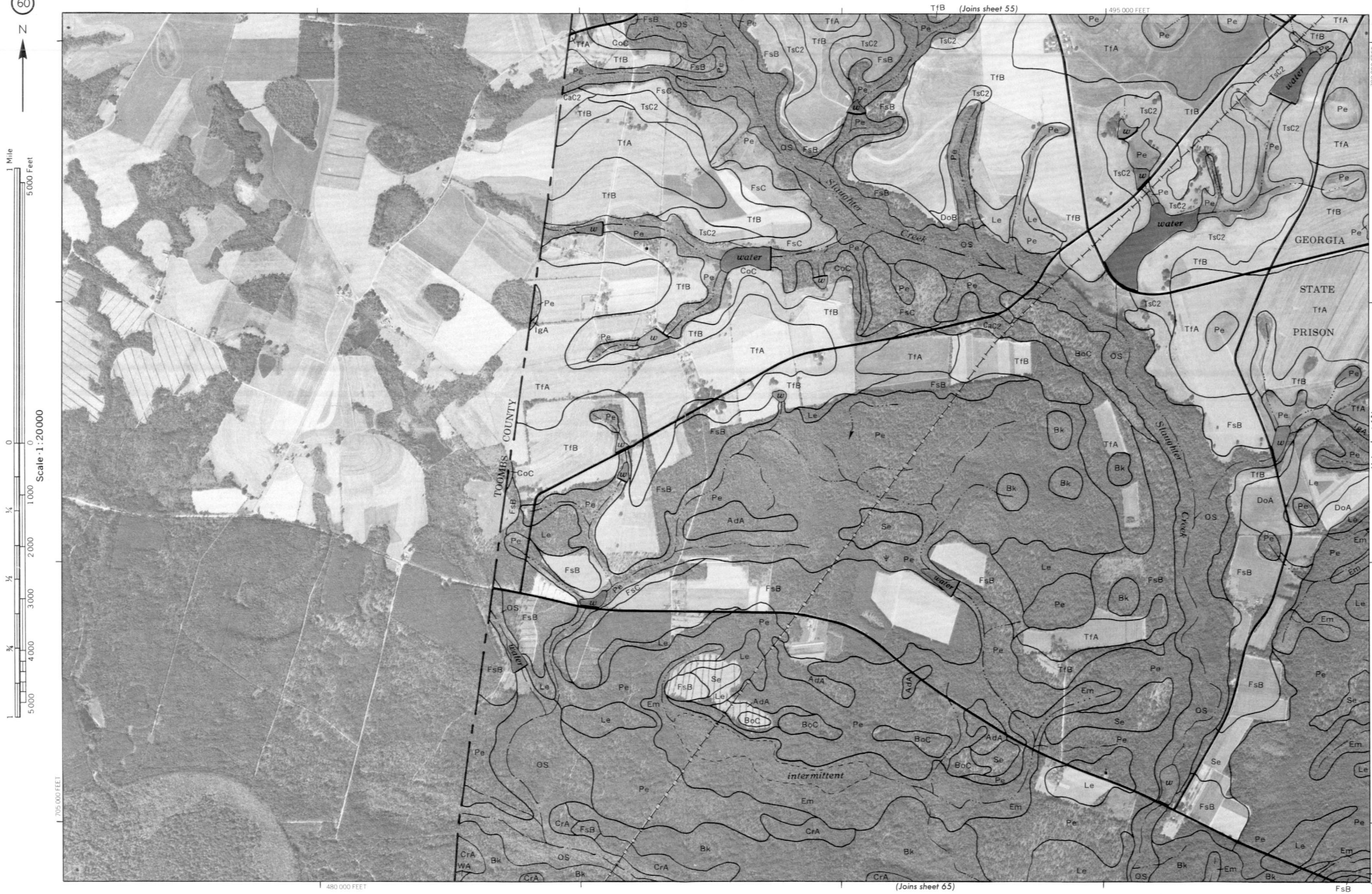
(Joins sheet 49)
(Joins sheet 56)
(Joins sheet 60)
480 000 FEET
495 000 FEET
735 000 FEET
725 000 FEET
GEORGIA STATE PRISON
TOOMBS COUNTY
Four Acre Creek
Slaughter Creek
N
1 Mile
5000 Feet
Scale 1:20000

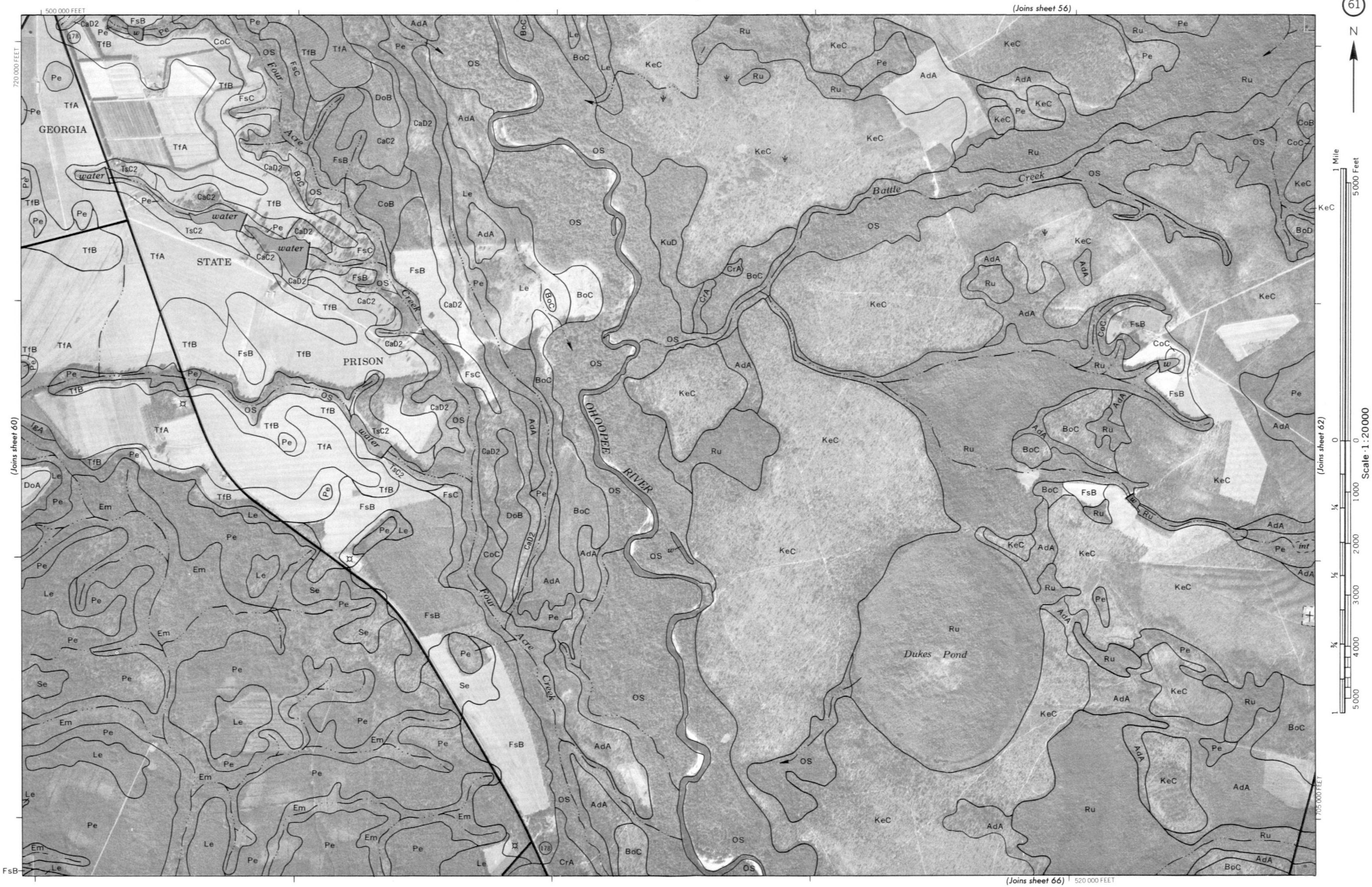

N
(Joins sheet 50)
(Joins sheet 55)
(Joins sheet 57)
(Joins sheet 61)
520 000 FEET
735 000 FEET
725 000 FEET
500 000 FEET
1 Mile
5000 Feet
Scale 1:20000
OHOOPEE RIVER
Thomas Creek
Four Acre Creek
GEORGIA STATE PRISON
water
intermittent water
147
178


525 000 FEET
735 000 FEET
(Joins sheet 51)
(Joins sheet 56)
(Joins sheet 58)
(Joins sheet 62)
545 000 FEET
725 000 FEET
Jones Millpond
Battle Creek
Creek
Battle
water
N
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000

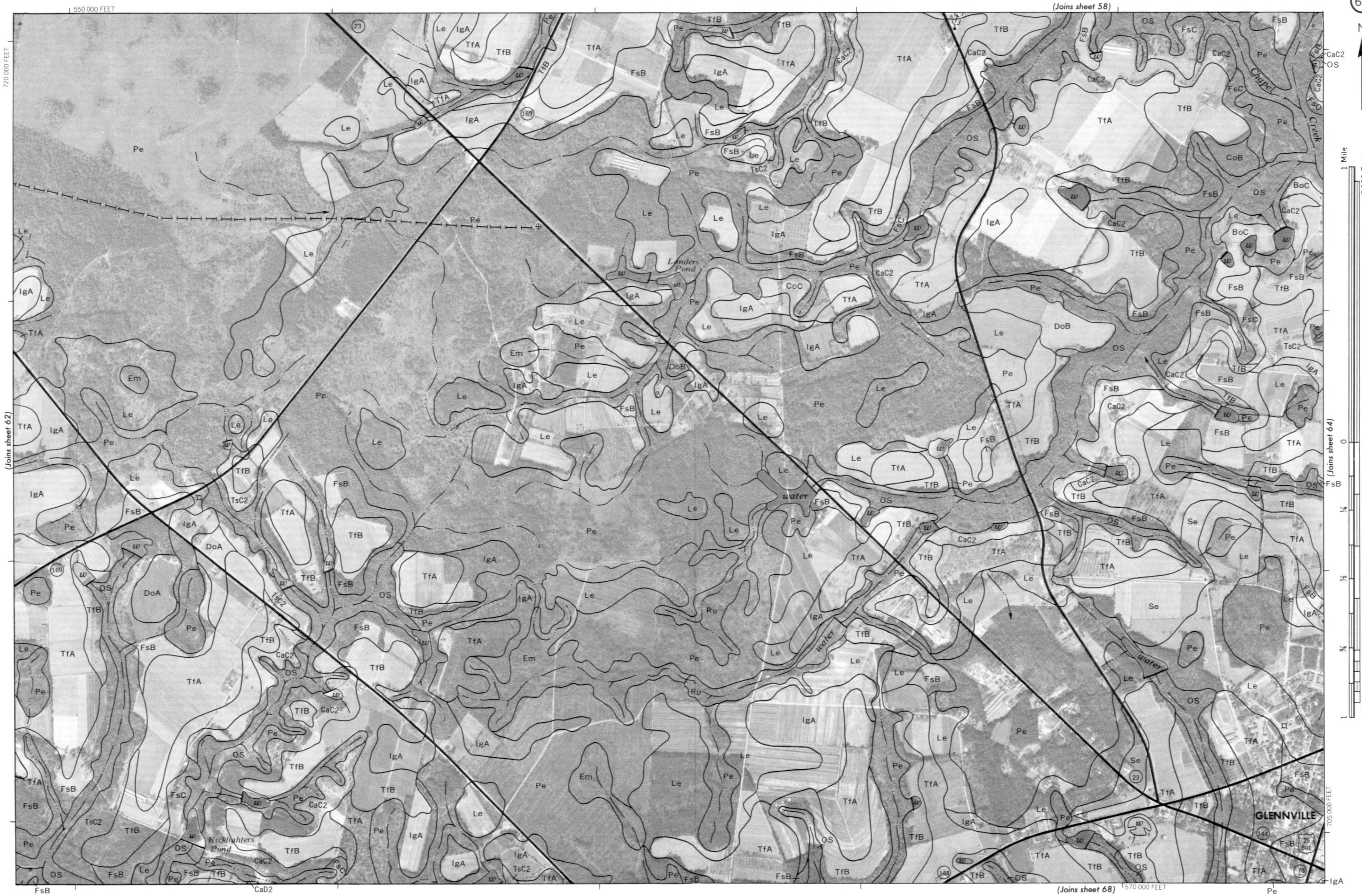

(Joins sheet 52)
(Joins sheet 57)
(Joins sheet 59)
(Joins sheet 63)
N
1 Mile
5000 Feet
Scale 1:20000
570 000 FEET
735 000 FEET
725 000 FEET
550 000 FEET
Mill Creek
South Prong
Beards Creek
169
23


59
N
(Joins sheet 53)
(Joins sheet 58)
(Joins inset, sheet 70)
(Joins sheet 64)
575 000 FEET
595 000 FEET
735 000 FEET
725 000 FEET
Groover Mill Pond
North Fork Beards Creek
Big Branch
Mill Creek
FORT STEWART
LONG COUNTY
Scale 1:20000
1 Mile
5000 Feet
0
1000
2000
3000
4000
5000
¼
½
¾
1


N
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
1000
2000
3000
4000
5000
(Joins sheet 55)
495 000 FEET
720 000 FEET
(Joins sheet 61)
(Joins sheet 65)
480 000 FEET
705 000 FEET
TOOMBS COUNTY
GEORGIA
STATE
PRISON
Slaughter Creek
Slaughter Creek
intermittent
water


61
(Joins sheet 56)
(Joins sheet 60)
(Joins sheet 62)
(Joins sheet 66)
500 000 FEET
520 000 FEET
720 000 FEET
705 000 FEET
GEORGIA
STATE
PRISON
OHOOPEE RIVER
Battle Creek
Four Acre Creek
Dukes Pond
water
178
N
1 Mile
5000 Feet
Scale 1:20000

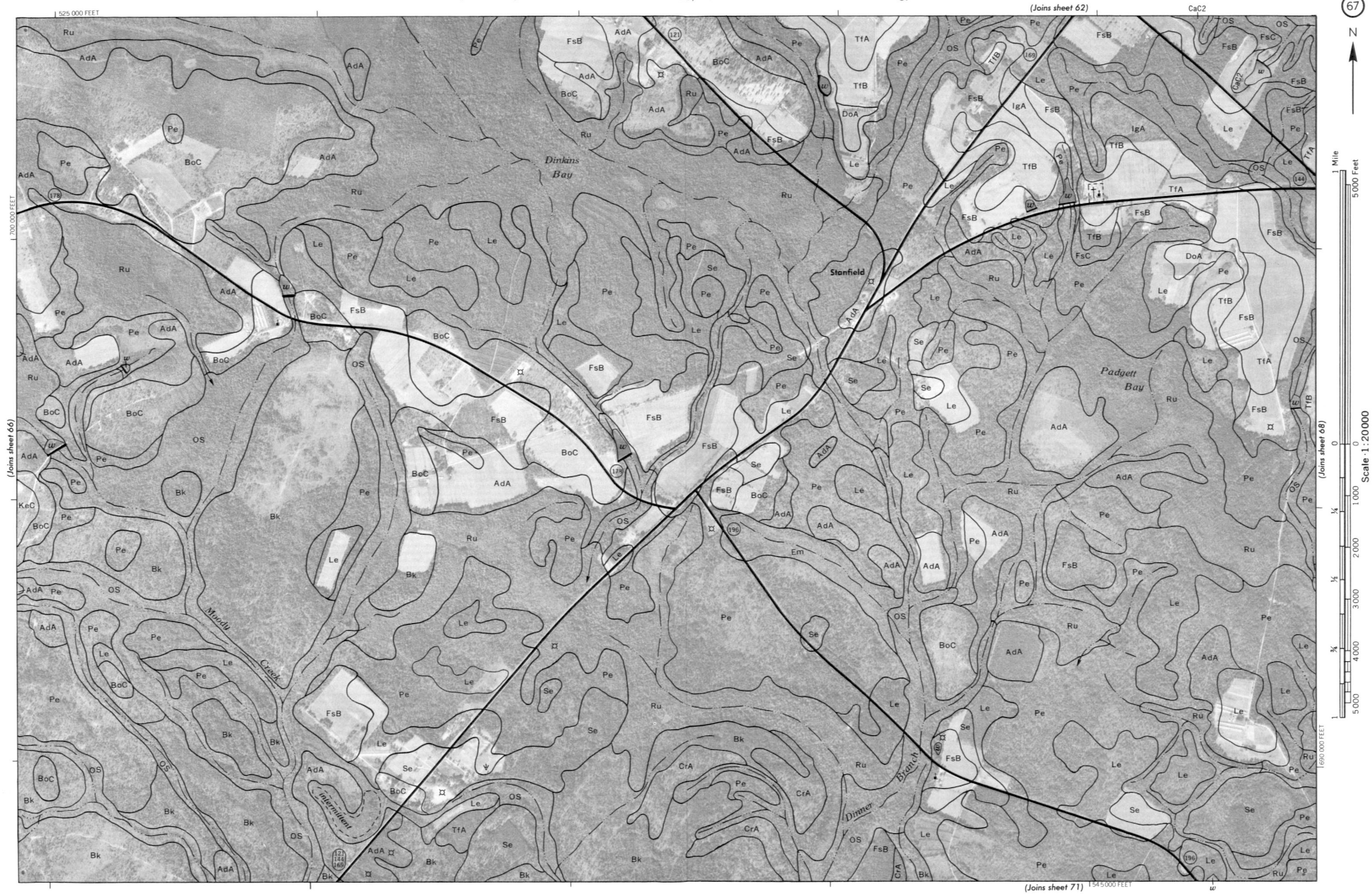

(Joins sheet 57)
(Joins sheet 61)
(Joins sheet 63)
(Joins sheet 67)
N
1 Mile
5000 Feet
Scale 1:20000
545 000 FEET
720 000 FEET
525 000 FEET
705 000 FEET
Battle Creek
Dinkins Bay
Padgett Pond
Watermelon Creek
Tison
121
169

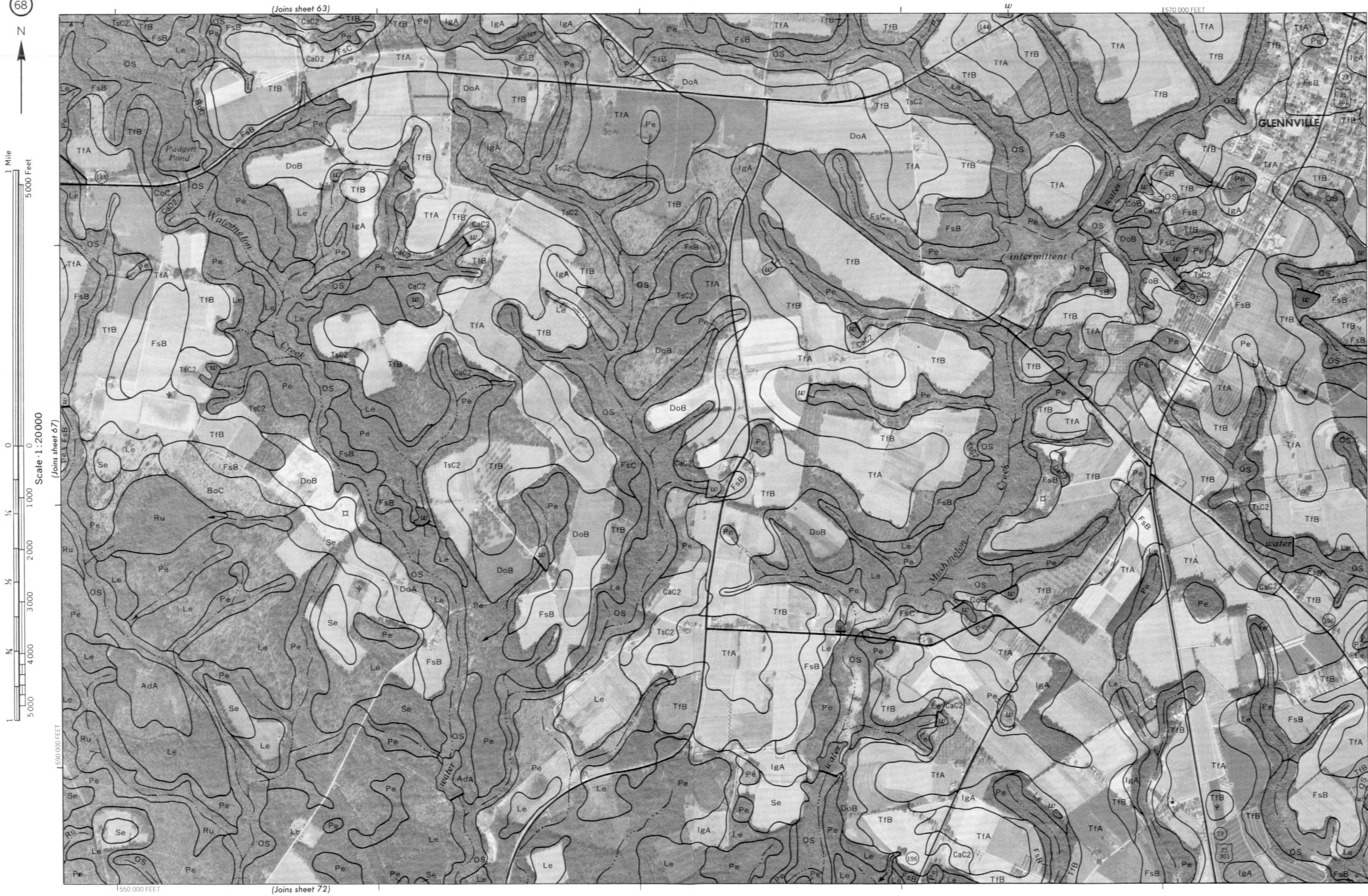

(Joins sheet 58)
(Joins sheet 62)
(Joins sheet 64)
(Joins sheet 68)
550 000 FEET
720 000 FEET
570 000 FEET
705 000 FEET
Landers Pond
Kicklighters Pond
Chapel Creek
GLENNVILLE
water
N
1 Mile
5000 Feet
Scale 1:20000

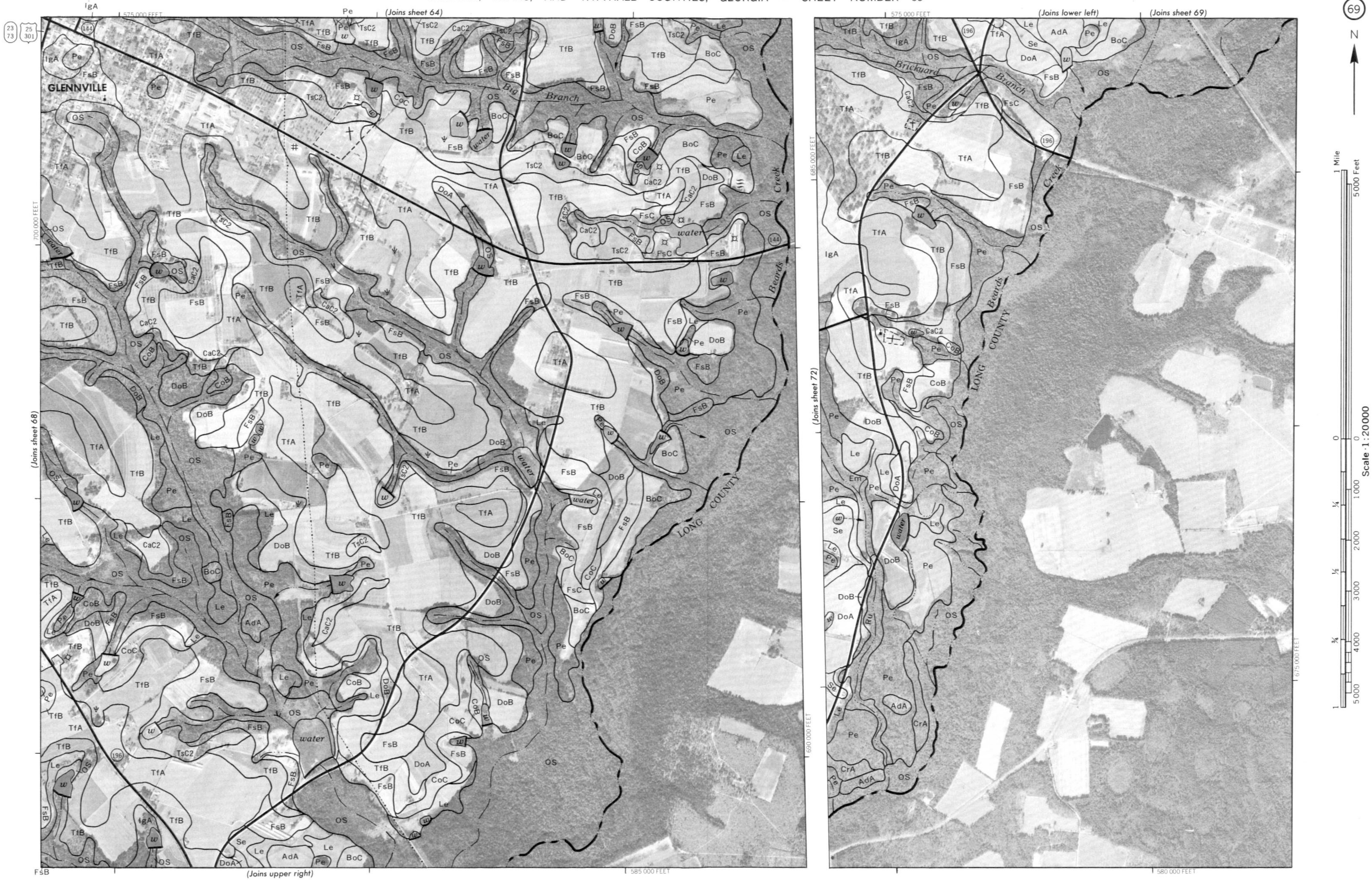

(Joins sheet 59)
(Joins sheet 63)
(Joins sheet 69)
N
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
¼
½
¾
1
595 000 FEET
720 000 FEET
575 000 FEET
705 000 FEET
FORT STEWART
GLENNVILLE
LONG COUNTY
Chapel
Beards
Blocker
Creek
By Pass
water
w
25
301
73
144
TfA
TfB
FsB
FsC
OS
Pe
CaC2
CaD2
TsC2
BoC
BoD
CoB
CoC
DoB
DoA
IgA
Le
WA
Em
Se
KeC
AdA

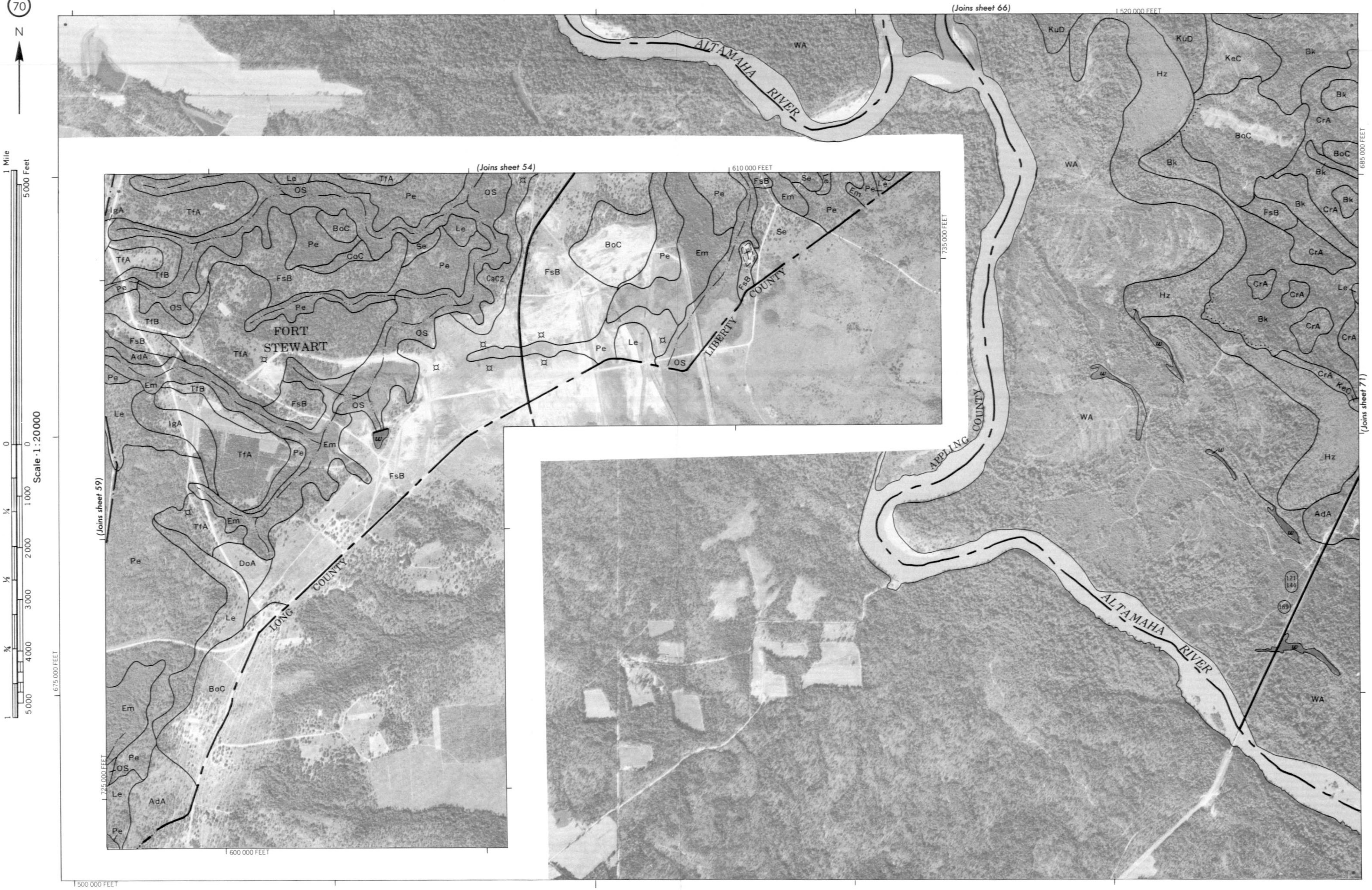

65
N
(Joins sheet 60)
(Joins sheet 66)
480 000 FEET
500 000 FEET
700 000 FEET
690 000 FEET
TOOMBS COUNTY
APPLING COUNTY
ALTAMAHA RIVER
Slaughter Creek
water
CrA
WA
Bk
BoC
Hz
OS
AdA
Le
Pe
FsB
Em
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
1000
2000
3000
4000
5000

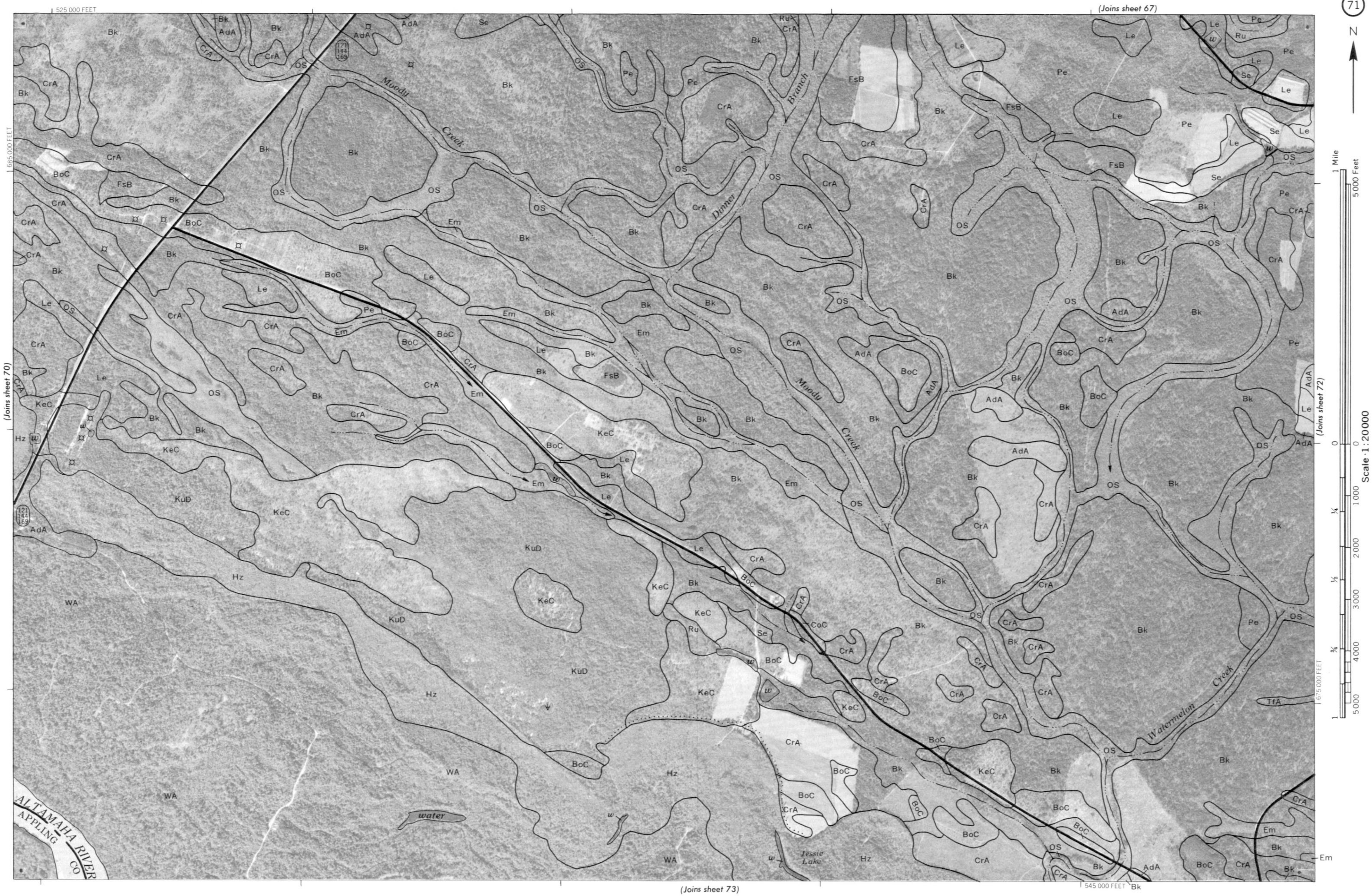

66
N
(Joins sheet 61)
(Joins sheet 65)
(Joins sheet 67)
(Joins sheet 70)
520 000 FEET
700 000 FEET
690 000 FEET
500 000 FEET
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
OHOOPEE RIVER
ALTAMAHA RIVER
APPLING COUNTY
Slaughter Creek
water
178

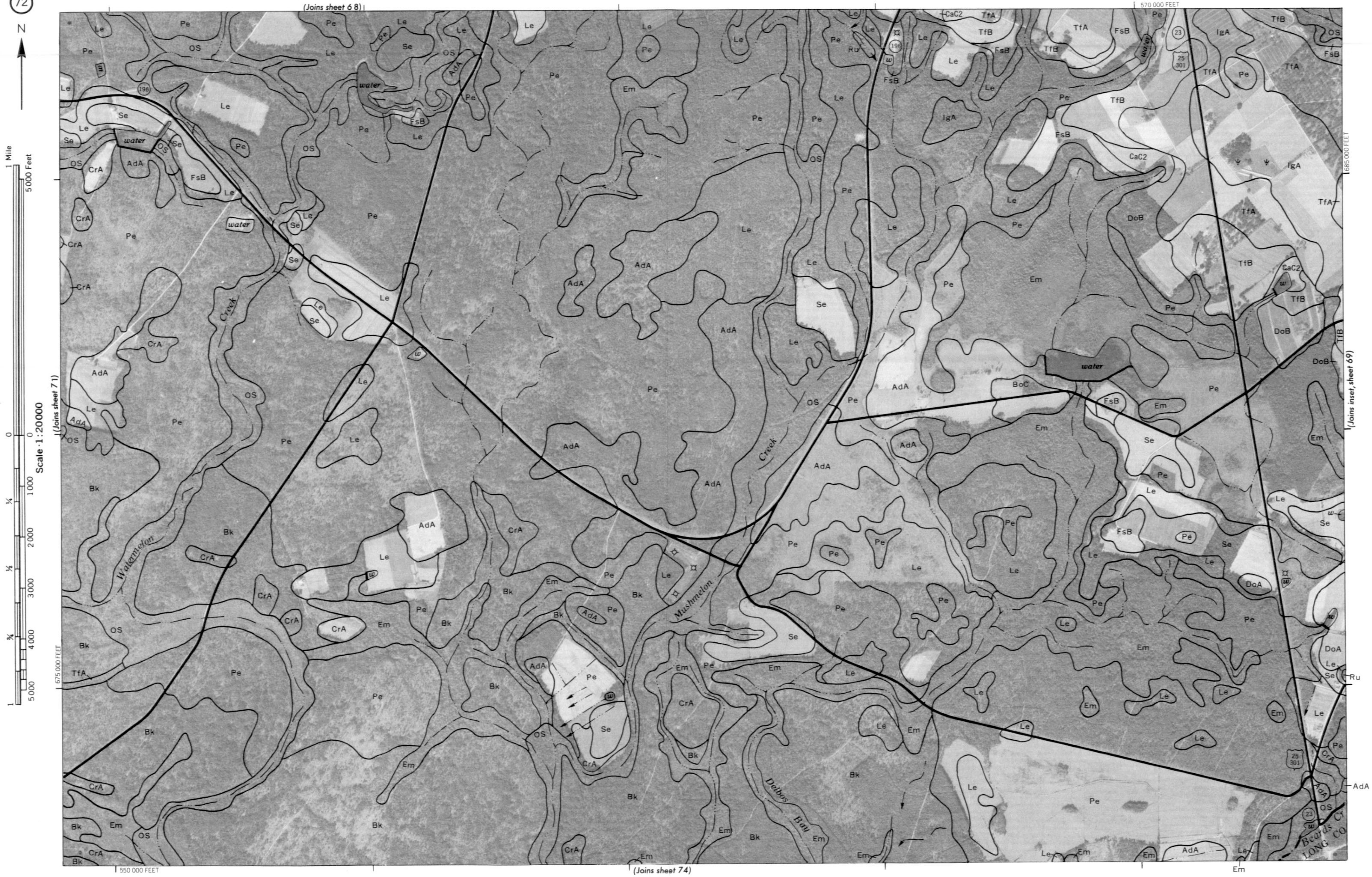

67
N
(Joins sheet 62)
(Joins sheet 66)
(Joins sheet 68)
(Joins sheet 71)
525 000 FEET
700 000 FEET
690 000 FEET
545 000 FEET
Dinkins Bay
Padgett Bay
Stanfield
Moody Creek
Dinner Branch
intermittent
1 Mile
5000 Feet
Scale 1:20000

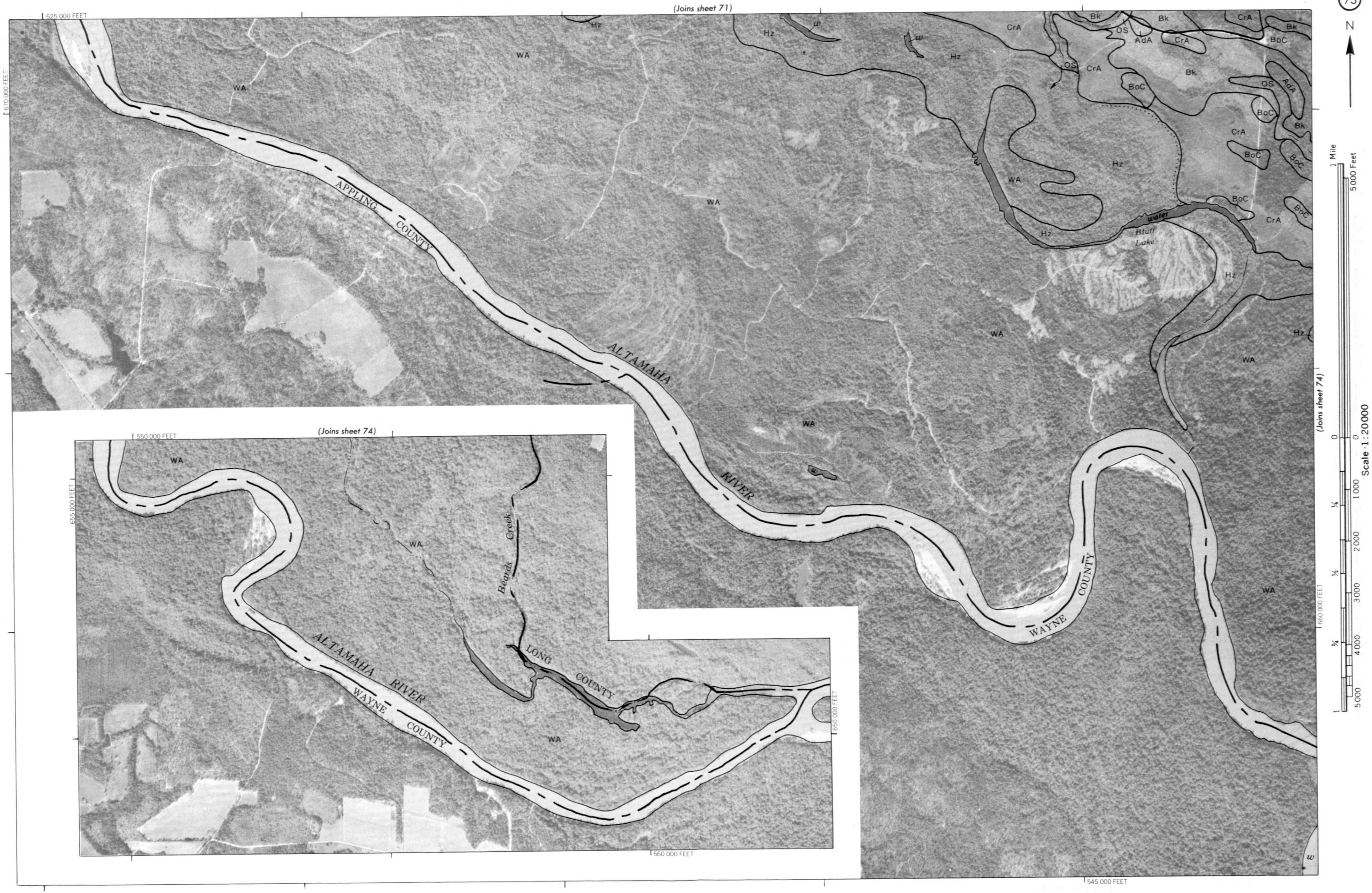

N
1 Mile
5 000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
(Joins sheet 63)
(Joins sheet 72)
(Joins sheet 67)
(Joins sheet 69)
570 000 FEET
550 000 FEET
700 000 FEET
690 000 FEET
GLENNVILLE
Padgett Pond
Watermelon Creek
Mushmelon Creek
intermittent
water
144
196
23
25
301

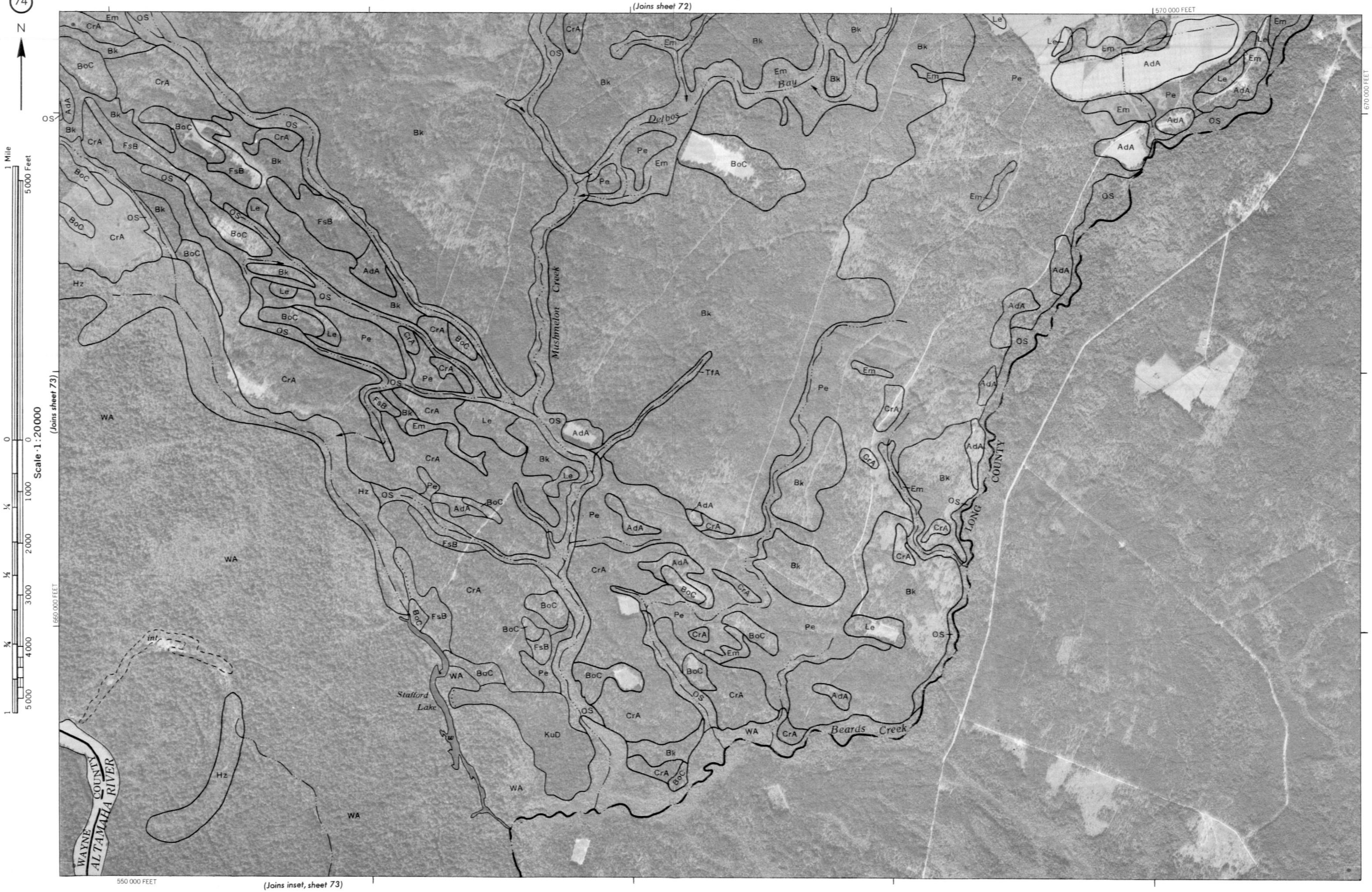

69
(Joins sheet 64)
(Joins lower left)
(Joins sheet 69)
(Joins sheet 68)
(Joins sheet 72)
(Joins upper right)
GLENNVILLE
Big Branch
Brickyard Branch
Beards Creek
LONG COUNTY
575 000 FEET
585 000 FEET
580 000 FEET
700 000 FEET
690 000 FEET
685 000 FEET
675 000 FEET
N
1 Mile
5000 Feet
Scale 1:20000


70
N
1 Mile
5000 Feet
Scale 1:20000
(Joins sheet 66)
(Joins sheet 54)
(Joins sheet 59)
(Joins sheet 71)
520 000 FEET
610 000 FEET
600 000 FEET
500 000 FEET
685 000 FEET
735 000 FEET
675 000 FEET
725 000 FEET
ALTAMAHA RIVER
FORT STEWART
LIBERTY COUNTY
LONG COUNTY
APPLING COUNTY
WA
KuD
KeC
Hz
Bk
CrA
BoC
FsB
AdA
Pe
OS
TfA
TfB
IgA
Le
Se
Em
CoC
CaC2
DoA
w
121
144
169


71
N
525 000 FEET
(Joins sheet 67)
685 000 FEET
(Joins sheet 70)
(Joins sheet 72)
(Joins sheet 73)
675 000 FEET
545 000 FEET
Moody Creek
Dinner Branch
Moody Creek
Watermelon Creek
ALTAMAHA RIVER
APPLING CO
Jessie Lake
water
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000


N
(Joins sheet 68)
(Joins sheet 71)
(Joins inset, sheet 69)
(Joins sheet 74)
570 000 FEET
685 000 FEET
675 000 FEET
550 000 FEET
1 Mile
5000 Feet
Scale 1:20000
Watermelon Creek
Creek
Mushmelon Creek
Delbos Bay
Beards Cr
LONG CO


73
N
(Joins sheet 71)
(Joins sheet 74)
(Joins sheet 74)
525 000 FEET
670 000 FEET
550 000 FEET
655 000 FEET
660 000 FEET
650 000 FEET
560 000 FEET
545 000 FEET
APPLING COUNTY
ALTAMAHA RIVER
WAYNE COUNTY
LONG COUNTY
Beards Creek
Bluff Lake
water
WA
Hz
CrA
Bk
BoC
OS
AdA
w
1 Mile
5000 Feet
Scale 1:20000


74
N
(Joins sheet 72)
(Joins sheet 73)
(Joins inset, sheet 73)
570 000 FEET
670 000 FEET
660 000 FEET
550 000 FEET
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
1000
2000
3000
4000
5000
Delbos Bay
Mushmelon Creek
Beards Creek
Stafford Lake
LONG COUNTY
WAYNE COUNTY
ALTAMAHA RIVER
Int
Bk
Pe
CrA
BoC
OS
Em
AdA
Le
FsB
WA
Hz
KuD
TfA